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CONTENTS AND SUBJECT INDEX

The Value of Specialization in Medicine. Louis A. Buie, M.D., Rochester, Minn. 917

Treatment of Thrombosis of the Lateral Sinus Without Ligation of the Internal Jugular Vein. M. S. Ersner, M.D., and David Myers, M.D., Philadelphia 919

Discussed by Drs. Taylor, Jones, Meltzer, Friesner, Kemler and Ersner.

Right Colectomy for Malignant Disease: A Discussion of the Mortality Associated with Various Operative Procedures. Arthur W. Allen, M.D., Boston 923

Discussed by Drs. Rankin, Stone and Allen.

Hypertrophy of the Ligamenta Flava as a Cause of Low Back Pain. R. Glen Spurling, M.D., Louisville, Ky.; Frank H. Mayfield, M.D., Cincinnati, and James B. Rogers, M.D., Louisville, Ky. 928

Discussed by Drs. Haggart, Gratz, Ober and Spurling.

Culture of Human Marrow: Length of Life of the Neutrophils, Eosinophils and Basophils of Normal Blood as Determined by Comparative Cultures of Blood and Sternal Marrow from Healthy Persons. Edwin E. Osgood, M.D., Portland, Ore. 933

Discussed by Drs. Kracke, Lurie, Garrey and Osgood.

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Bacillus Proteus Pyelonephritis with Thrombophlebitis of the Intrinsic Renal Veins and Septicemia. E. F. Hirsch, M.D., and Dorothy A. Shapiro, B.S., Chicago 937

Bleeding Peptic Ulcer in Meckel's Diverticulum. James E. Thompson, M.D., New York 938

SPECIAL CLINICAL ARTICLE

Automobile Injuries. C. L. Straith, M.D., Detroit 940

SPECIAL ARTICLE

Physical and Physiologic Principles of Air Conditioning: Part II. C. P. Yaglou, M.S., Boston 945

COUNCIL ON PHYSICAL THERAPY 951

COUNCIL ON PHARMACY AND CHEMISTRY 952

EDITORIALS

The Toxicology of New Industrial Compounds 956

The Citadel 956

Panic, Publicity and Polio 957

CURRENT COMMENT

The Zinc Sulfate Spray for the Prevention of Poliomyelitis 958

Motion Picture Education 958

Public Health Features of Rheumatic Heart Disease 959

Pneumothorax from Experimental Overinflation of Lung 959

The Danger of Eating Rhubarb Leaves 960

BUREAU OF LEGAL MEDICINE AND LEGISLATION 983

(Subject Index on next page)

A.M.A. SESSION—San Francisco—JUNE 13-17, 1938

Symposium on Pediatrics

The Medical Clinics of North America are Books of Clinical Medicine that are devoted entirely to giving the Practicing Physician up-to-date and worthwhile help in dealing with his problems of daily practice. Issued one every other month, each number contains a Symposium on some subject of outstanding interest, and in addition, 10 to 20 other practical clinics.

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See Details in SAUNDERS ADVERTISEMENT—Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml. Medicolegal; "ME," Medical Economics.

Académie de chirurgie....966
Accademia medico-fisica....969
Acid, cevitamic, in milk....ab-988
Addison's Disease, adrenal cortex extracts in....ab-993
Air conditioning, A. M. A. committee report....*945
Alcoholism, Widmark test for alcohol in blood....976
Allergy, committee urges instruction in....964
Anemia, injecting bone marrow for....ab-996
Angina Pectoris, surgical treatment....965
Argyria after neosilvol nose drops....977
Arthritis, skin tests with bacteria....ab-988
Automobile injuries....*940
Aviation and contagious diseases....968
Bacillus, colon, prostatitis and vaginitis....975
proteus pyelonephritis....*937
Backache, hypertrophy of ligamenta flava..*928
Bacteria products, skin tests with....ab-988
Basophils, culture of human marrow....*933
Beriberi, cardiovascular disease in....ab-986
Blood acetone, simple method for determination....ab-989
alcohol in, Widmark test for....976
fats, variations in lipemia....ab-989
pressure, high, effects of sympathectomy in....973
pressure, high, epinephrine as cause...ab-994
proteins after thoracoplasty....ab-995
uric acid, determination....ab-994
Board Examinations....978
Bone marrow, culture....*933
marrow injection for anemia....ab-996
splints, magnesium alloy....967
Book Notices....979
Books Received....Adv. page 34
Brain, changes produced by exposure to radium....ab-992
Brass poisoning....972
Bureau of Legal Medicine and Legislation..983
Cabot, Hugh, letter to promote sales of The Citadel....E-956
Cancer, postoperative irradiation....ab-997
Capsule, ordinary or enteric coated....974
Carbon Dioxide, mine gases....975
Cardiovascular Disease in beriberi....ab-986
Charcoal treatment, intravenous....ab-998
Citadel: by Dr. Cronin....E-956
Climacteric, male, is there any?....977
Cocaine solution, sterilization; preservation..977
Coelothelioma, epicardiac....ab-998
Coitus, tuberculous epididymitis and....977
Colon, right colectomy for malignant disease.*923
Columbia University, short graduate courses.963
Conjunctivitis, quinine for....ab-990
Cornea, dendritic ulcer....976
Correspondence....972
Council on Pharmacy and Chemistry....952
Council on Physical Therapy....951
Cronin, A. J., The Citadel....E-956
David, Norman A., appointed professor of pharmacology....963
Deaths....970
Dermatology, prize for work in....965
Diabetes, Renziehausen Memorial Ward and Clinic....963
Diathermy, effect of short wave on stomach....ab-996
Diet and resistance to bactericidal infection....ab-993
effect on sterility, growth and survival..ab-993
Duke University, division of neurologic surgery....963
Dystrophy, progressive muscular, and vitamin C....ab-996
Eczema, infantile....ab-990
Endocrine products, ordinary or enteric coated....974
Eosinophils in periarteritis nodosa....977
culture of human marrow....*933
Epididymitis, tuberculous, and coitus....977
Epinephrine as cause of hypertension?...ab-994
Ergotamine tartrate in migraine....977
Face, automobile injuries....*940
Fireworks, dangerous amateur....965
Foot and Mouth Disease, virus....ab-993
Foreign Letters....965
Fractures, magnesium alloy bone splints....967
Gangrene, gas, complete delimitation for..ab-997
Gasoline, domestic use of....965
Glasses, contact lenses....977
Government Services....965
Growth, effect of diet....ab-993
effect of milk....968
factor in summer milk (grass or grass juice)....ab-989
Hair, gray, use of vitamin B complex in restoring color....976
Hands, infections, in meat handlers....975
Heart, coelothelioma....ab-998
cripple, vs. panic, publicity and polio...E-957
disease, rheumatic, public health features....E-959
echinococcus....ab-998
electrocardiography in small children...ab-985
Heat, salt tablets for—possible overdosage...972
Hematomas, posttraumatic juxtadural....ab-994
Hernia, development of, and large inguinal rings....974
Herpes simplex, recurrent, smallpox vaccine for....ab-987
zoster ophthalmicus, posterior pituitary solution in....976
Histamine, effect on biologic action of roentgen rays....ab-996
Hordeola, quinine treatment....ab-990
Hospitals, for Profit: care to be exercised by....Ml-983
Hydrogen sulfide, mine gases....975
Industrial compounds (new), toxicology..E-956
disease, symposium on, Northwestern U...961
employees, sickness increased, U. S.....964
hygiene, new division of, Alabama....960
Infection, bactericidal, diet and resistance to....ab-993
Intestines, aseptic ureterosigmoidostomy..ab-991
diverticulum (Meckel's), bleeding peptic ulcer in....*938
Jaundice, epidemic catarrhal....975
Volhard's test of water elimination in..ab-995
Weil's disease in animals....ab-997
Jaws fractures, automobile injuries....*940
Laboratory service, expanded, Iowa....961
League of Nations committee on nutrition..965
Ligamenta flava, hypertrophy....*928
Lip, upper, frenum of....974; 977
Lipoidosis, phosphatide....ab-998
Liver, amebic abscess of....ab-991
traumatic rupture....976
Lung, overinflation, pneumothorax from..E-959
Malaria project approved, Fla....960
Malpractice: limitation of actions; tort, not contract basis of action....Ml-984
nurses; liability for negligence of hospital nurse....Ml-984
Marriages....970
Measles, etiology, microscopic inquiry....ab-992
Meat handlers, infections of hands in....975
Medical Association of Georgia public relations bureau....961
Medical Examinations and Licensure....978
Medicine, specialization in....*917
practice, The Citadel....E-956
Medicolegal Abstracts....983
Meetings, Coming Meetings....984
Methane, mine gases....975
Migraine, ergotamine tartrate in....977
Milk, cevitamic acid content in....ab-988
effect on growth and metabolism....968
sofkurd....973
summer, growth factor in (grass or grass juice)....ab-989
Mine gases and their effects....975
Motion picture film on syphilis....E-958
Nephritis, clinical acute....ab-985
Nevus, cerebriform....ab-988
New and Nonofficial Remedies....955
News....960
Nitrogen, oxides of, mine gases....975
Nose, automobile injuries....*940
drops, neosilvol, argyria after....977
Nutrition, report of committee....965
Pancreas, irradiation of thymus effect on structure....ab-995
Paralysis agitans, drugs for....976
Parsons, F. W., resigns....963
Peptic Ulcer, bleeding, in Meckel's diverticulum....*938
Periarteritis nodosa, eosinophilia in....977
Physicians, panel, graduate courses for....966
Pituitary, posterior, solution in treating herpes of eye....976
Pneumococcus infections, quinine therapy....ab-996
Pneumoperitoneum, artificial, after puerperium in pulmonary tuberculosis....ab-995
in pulmonary tuberculosis....ab-986
Pneumothorax from overinflation of lung..E-959
spontaneous, unusual forms....ab-994
Poliomyelitis, epidemic, in Australia....966
panic, publicity and....E-957
prevention, zinc sulfate spray for....E-958
Propylene glycol, toxicology....E-956
Prostate, enlargement, roentgen therapy..ab-997
Prostatitis, colon bacillus....975
Pterygium, treatment, quinine....ab-990
Pyelonephritis, Bacillus proteus....*937
Queries and Minor Notes....972
Quinine, local use in ophthalmology....ab-990
therapy of pneumococcus infections....ab-996
Radium, changes in brain after exposure..ab-992
Raynaud's Disease....976
Registration due....961; 962
Rheumatic Fever, puberty and prognosis..ab-985
public health features of heart disease..E-959
Rheumatism, clinic to study, Mich....962
Rhubarb leaves, danger of eating....E-960
Ringworm due to Trichophyton gypseum..ab-992
Roentgen Rays, histamine effect on action of....ab-996
Roentgenology, Austrian Society of....968
Royal College of Surgeons guests of Paris Academy....966
Salt tablets for heat—possible overdosage....972
Scalp, cerebriform nevus resembling cutis verticis gyrata....ab-988
Schools: demonstrations of theory of healing not practice of medicine....Ml-983
Science exhibit at Indianapolis....964
Septicemia, thrombophlebitis of intrinsic renal veins and....*937
Sex degeneracy, group to study, Chicago....961
Shock....ab-990
Skin disease, exudative discoid and lichenoid chronic....ab-987
tests with bacterial products....ab-988
Sloan, L. H., appointed professor of medicine.961
Smallpox vaccine treatment of recurrent herpes simplex....ab-987
Society Proceedings....984
SofKurd Milk....973
Specialization in medicine....*917
Spine, hypertrophy of ligamenta flava as cause of low back pain....*928
Staphylococcus infections, toxoid in....967
State Board Examinations....978
Sterility, effect of diet on....ab-993
Stomach, partial gastrectomy....ab-992
short wave treatment effect....ab-996
upsets in child with positive Wassermann.973
Surgery, plastic, automobile injuries....*940
Sympathectomy, effects in hypertension....973
Syphilis, congenital, ophthalmoplegia and gastric upsets in....973
history of....C-972
motion picture film on, reservations....E-958
of new-born, Wassermann on cord blood not reliable criterion....977
serodiagnosis, Ide color test....972
Thalamus syndrome....974
Thiamin chloride, term for vitamin B_1....952
Thomson, J. G., death....966
Thrombophlebitis of intrinsic renal veins and septicemia....*937
Thrombosis, deep, arterial symptoms in, in lower extremities....ab-998
sinus (lateral), treatment....*919
Thymus, irradiation, effect on structure of pancreas....ab-995
Tonics and Sedatives....Adv. page 26
Trichophyton gypseum, ringworm due to..ab-992
Tuberculin allergy, seasonal cycle....ab-995
Tuberculosis, Mississippi Valley Conference.964
mortality in 1936, Arizona....960
Tuberculosis, Pulmonary, acute, in adolescents....967
artificial pneumoperitoneum after puerperium in....ab-995
blood proteins after thoracoplasty in....ab-995
treatment, pneumoperitoneum in....ab-986
U. S. Civil Service Commission examination.965
University of Minnesota graduate courses...962
of Tennessee department of preventive medicine....964
Ureterosigmoidostomy....ab-991
Uric Acid, determination....ab-994
Urine acetone, simple method for determination....ab-989
Vaginitis, colon bacillus....975
Venereal Disease program, Nevada....962
Vitamin A deficiency (correction)....965
B complex for restoring color to gray hair.976
B_1 deficiency in cardiovascular disease..ab-986
B_1, thiamin chloride....952
C and progressive muscular dystrophy..ab-996
Welding, electric arc....975
Zinc sulfate spray for preventing poliomyelitis....E-958

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THE VALUE OF SPECIALIZATION IN MEDICINE

CHAIRMAN'S ADDRESS

LOUIS A. BUIE, M.D.

ROCHESTER, MINN.

In past ages the majority of physicians remained in a middle state, being neither very capable nor yet entirely inefficient, neither very altruistic nor very vicious, but living each day in peaceful mediocrity, accepting current opinions without skepticism or desire for proof, exciting no interest or envy, causing no wonder, just maintaining their position on a level with their generation and innocuously conforming to the intellectual and scientific standards of the period and country in which they lived. Their guiding principle was a blind and unhesitating credulity, but they were so tenacious of the opinions which they imbibed that whatever first occupied their understanding was likely to mold much that followed. Constantly proceeding under the guidance of contemporary opinion, they created nothing new but merely ambled along in dull and monotonous uniformity, performing their duties according to current standards.

Such acquiescence inevitably engenders apathy, and such a cold spirit of routine acts on men like a blight, blunting their faculties and withering their powers. Under such conditions there is a sensible decay in that vigor of character and in that diversity and audacity both of conception and of execution which paves the way to achievement. Despite adverse circumstances, however, history has proved that mankind possesses more virtue than vice and that good actions, if not more abundant, are more productive of permanent effects than bad ones. If it were otherwise, the very preponderance of evil would doubtless have destroyed us long ago and there would not by this time have been left even a single individual to lament the degeneracy of his species.

Thus we have not succumbed to evil methods but have benefited by the influence of those really great spirits whose works are among the glories of medical science. Their discoveries have come down as eternal truths which have survived the shock of empire and outlived the struggles of rival creeds. Their influence shall reach the most distant posterity and after the lapse of centuries shall produce more effect than at the moment of their promulgation.

Knowledge is not an inert or passive principle. It must be sought before it can be won. It is the product of great labor and of great sacrifice, and men who are perfectly content with their intellectual allotment will not incur this labor. For centuries civilization struggled along attended largely by men without science—men who practiced methods of healing based solely on empiricism. They possessed little knowledge and had little desire for it. At length, however, reason began to display its power and to disperse the mists by which it was surrounded. Even the most casual observer, witnessing the progress of science through the ages, becomes impressed with the undeniable truth that the significant part of genius is work and that the achievements of our predecessors have been due to endless labor and concentrated effort in specialized fields.

It was Andreas Vesalius, for example, a profound and energetic student, who during the sixteenth century freed the study of anatomy from the many prejudices which had surrounded it because of the theological concept of the sanctity of the human body and its ultimate resurrection. It was he who paved the way for such peerless students as Miguel Servetus, who discovered that the blood in the pulmonary circulation passes into the heart after being mixed with the air in the lungs and who was burned at the stake by order of Calvin because of a "theological quibble." The teachings of Vesalius were sustained by his contemporaries Fallopius, Sylvius and Eustachius and were rendered accessible to surgeons by Ambroise Paré, who reintroduced the use of the ligature in amputations, made the first exarticulation of the elbow joint, described fracture of the neck of the femur, first suggested syphilis as a cause of aneurysm, and by his description made podalic version practicable.

In the seventeenth century the name of William Harvey of course stands out as the greatest of that period, and although the circulation of the blood might have been previously inferred by Servetus, guessed at by Galen or witnessed by any wounded slave, it was Harvey who studied all preexisting theories and who by anatomic dissection and experiment proved the muscular action of the heart and its effects on the motion of the blood. With the aid of the microscope, which he invented, Leeuwenhoek first described the spermatozoa (1674) and gave the first complete account of the red blood corpuscles. He discovered the striped character of voluntary muscle and made other discoveries in the microscopic field. Capillary anastomosis between the arteries and veins, which was the only phase of the circulation that remained obscure to Harvey, was observed by Malpighi (1660), and this tireless student has become known as the founder of histology.

The seventeenth century also produced Descartes, who was responsible for the first European textbook on physiology; Sylvius, who "did for Harvey's ideas what Paré had done for those of Vesalius"; Glisson, the anatomist, physiologist and pathologist, who first gave a classic description of infantile rickets, first described the capsule of the liver investing the portal vein and first employed suspension in the treatment of spinal

From the Section on Proctology, the Mayo Clinic.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

deformities; and Thomas Sydenham, who gave a new interpretation of internal medicine.

The eighteenth century gave us the master physiologist Albrecht von Haller; Lavoisier, who discovered the true nature of the interchange of gases in the lungs; the great anatomist and surgeon Antonio Scarpa; William Hunter, the obstetrician, and his younger brother, the great John Hunter, whose contributions to the science of medicine are too numerous and well known to require review. In this period too we find Leopold Auenbrugger, who discovered and verified by postmortem study the value of immediate percussion of the chest in diagnosis; Morgagni, who in his seventy-ninth year published the true foundation of modern pathologic anatomy; Gaspar Casal, a Spanish physician who in 1735 first described pellagra; Edward Jenner, who successfully introduced preventive inoculation in 1798, and Benjamin Franklin, who invented bifocal lenses in 1784, later invented a flexible catheter, and who treated nervous diseases by electricity.

The nineteenth century produced Laënnec, who invented the stethoscope; Pierre Bretonneau, who performed the first successful tracheotomy in a case of croup and who located and described the typhoid lesions in Peyer's patches; Philippe Ricord of Baltimore, who was the greatest authority on venereal diseases after John Hunter; and Robert James Graves, Richard Bright, Thomas Addison, Thomas Hodgkin, James Parkinson, Carl Rokitansky, Oliver Wendell Holmes, Sir Charles Bell, Johannes Müller and the physiologist William Beaumont. In our own country future generations will revere the names of Ephraim McDowell and James Marion Sims; in England, those of Lord Lister, Thomas Henry Huxley and Sir William Turner; in Switzerland, Wilhelm His; in Russia, Metchnikoff and Ivan Pavlov; in Germany, Rudolf Virchow, Cohnheim and Koch, and in France the great Louis Pasteur. The work of Long, Wells and Morton is too well known to require repetition here.

In the year 1851 Hermann von Helmholtz invented the ophthalmoscope. In 1852 Henry J. Bigelow performed the first excision of the hip joint, and in 1873 Theodor Billroth made the first complete excision of the larynx. In the same year Koch found the spirillum of Asiatic cholera, and in 1879 Hansen discovered the bacillus of leprosy. In 1880 Karl Joseph Eberth discovered Bacillus typhosus, Koch isolated the bacillus of tuberculosis, and Alphonse Laveran identified the parasites of malaria in the red blood cells. In 1882 Friedrich Löffler discovered the bacteria of erysipelas in swine and the cause of glanders and, with Edwin Klebs, found the bacillus of diphtheria. The cause of tetanus was discovered by Arthur Nicolaier in 1884, and in 1883 Fränkel isolated the pneumococcus. X-rays were discovered by Wilhelm Konrad Roentgen in 1895, and radium was discovered by the Curies in 1898. Sir Ronald Ross in 1897 discovered Laveran plasmodia in the wall of the stomach of Anopheles mosquitoes which had fed on blood of malarial patients. In 1901 the work of Walter Reed, Carroll and the martyr Lazear established Stegomyia fasciata as the transmitting agent in yellow fever.

In 1905 Fritz Schaudinn discovered Spirochaeta pallida. This was followed in 1906 by August von Wassermann's diagnostic test of syphilis, which he affirmed could never have been discovered had not Paul Ehrlich previously propounded the theory that the living protoplasmic molecule consists of a stable nucleus and unstable peripheral side chains, or chemoreceptors, which enable it to combine chemically with food substances and neutralize toxins or other poisons by throwing out detached side chains into the blood. Ehrlich's arsphenamine appeared in 1910.

Our present generation witnesses the work of Flexner, Banting, Frei, Schick, Rosenau, the Dicks and others, and many have had opportunity to learn first hand from Osler, DaCosta, Janeway, Billings, Kelly and Welch. According to Garrison, the Mayos have made improvements in visceral surgery, and their genius for method and system has made listerian surgery a reliable science.

Thus we observe that, in medicine, materials have been collected which present a rich and imposing appearance, and what has characterized those eminent scientists who have been responsible for these immortal bequests and given them their real superiority is that fine and delicate perception which is due partly to experience, partly to their inherent aptitude in discovering analogies and differences which ordinary observers are unable to detect, but, most of all, to their ceaseless labor. The more sensibility and genius they possessed, the more they attached to themselves ideas that elevated them, and their doctrines have become our law. They displayed a boldness of inquiry, a recklessness in the pursuit of truth and a disregard of traditional opinion that entitles them to the highest praise. Their accomplishments have been only a part of that vast movement by which the human intellect, with infinite difficulty, has vindicated its own right and slowly emancipated itself from inveterate prejudices which long impeded its action.

From the foregoing historical review, it will be observed that specialism is not new. "I will not cut persons laboring under the stone but will leave this to be done by men who are practitioners of this work." In this language Hippocrates expressed his sentiments regarding specialization, and it is known that long before his time there were those who limited their work to various phases of medicine. It was probably not until the beginning of the nineteenth century, however, that specialization began to assume definite form. In 1804 the Royal Ophthalmic Hospital was founded in London, and in 1814 the Royal Hospital for Diseases of the Chest. A hospital for the practice of obstetrics was established in Boston in 1830.

In our own generation we are witnessing a new development in specialization. With the advance of medical science it becomes more and more evident that no single individual is capable of caring for all the ills to which the human body is heir. The general practitioner, the surgeon, the internist and the specialist himself seek assistance from those who by limiting their attention to a certain phase of medicine have become skilful in its management. Thus "group practice" has been evolved, and it appears that a difficult problem is more likely to reach solution in the hands of several physicians interested in various phases of that problem than if one physician attempts the task. For example, a patient with gastric distress may meet the internist, the gastro-enterologist, the radiologist and often the surgeon during the course of his examination. Such specialism may be carried to what is at present considered by some to be an undesirable extreme. For example, in the field of gastro-enterology there are men who specialize in the treatment of duodenal or gastrojejunal ulcer, esophageal diseases, gastric disorders, diseases of the gallbladder, amebic dysentery, ulcerative colitis and other conditions. Then there is the physician who has the temerity to deal only with the problems of

those who suffer from functional disorders of the gastro-intestinal tract. Abuses have developed, but probably every new truth that has been propounded has for a time caused mischief. Progress depends on change, and it is only by practicing uncustomary things that one can discover whether they are worthy. It is also likely that most opinions held by the majority were once limited to the minority. In fact, if the opinions of the majority had always prevailed, Christianity would have passed into oblivion at the time of the Crucifixion.

There is therefore no room or reason for discouragement as we face our task. It is probable that our generation has seen the beginning of a period which will be known as the age of specialization. We are fortunate in that, in the main, our destiny is in the hands of the Council on Medical Education and Hospitals of the American Medical Association and the Advisory Council for Medical Specialties. These bodies have performed signal service, and the fact that the latter is now composed of representatives of twelve separate specialties, with individual boards that determine the fitness of applicants seeking certification, indicates the progress which has been made. Under their guidance we may expect that there will soon be none who will be admitted to specialty practice without suitable qualifications based on fundamental training in medicine and surgery and final study and experience in the special field. The fact that under adverse circumstances such advance has been made is proof of the integrity of the scheme as well as of the commendable zeal of its protagonists. This justifies the belief that their aims will ultimately be achieved.

TREATMENT OF THROMBOSIS OF THE LATERAL SINUS

WITHOUT LIGATION OF THE INTERNAL JUGULAR VEIN

MATTHEW S. ERSNER, M.D.
AND
DAVID MYERS, M.D.
PHILADELPHIA

The treatment of phlebitis and thrombosis of the lateral sinus has attracted discussion in otologic circles for many years. That it is still a moot subject is evidenced by the voluminous literature and the varying opinions expressed by the many leaders of our specialty. It is only by exchange of ideas and comparison of methods employed that the treatment of this dangerous complication will some day be settled to the satisfaction of all.

The precedents established by the early pioneers, Zaufal, Lane and Ballance, and others, have served to predicate for many years the mode of attack. That the ideal in therapy has not been achieved by the ligation of the internal jugular vein, or its resection, is easily ascertained by the high mortality rate various authors report.

Krepusca (quoted by Rott [1]) reported 295 cases of involvement of the lateral sinus. The mortality was higher for patients who were subjected to ligation than for those who were not. In a total of 132 cases of ligation seventy-four deaths occurred, or a mortality of 56 per cent, and in 163 cases of nonligation there were twenty-five deaths, or a mortality of 15 per cent. Later authors reported a lower mortality in the treatment of sinus thrombosis and phlebitis with newer modes of therapy, as in a series of cases reported by Coates, Ersner and Persky,[2] in which the mortality was only 14 per cent.

If ligation of the internal jugular vein is such a life-saving procedure and, as stated, shuts off the major portion of the cranial circulation from the general system, why is it that after the ligation many patients are still so very ill, that the period of hospitalization continues to average from six to seven weeks, that sepsis continues for many days after the operative procedure and that metastasis is so frequent after ligation? Meltzer [3] showed that metastasis occurred four times as often after ligation as before it. Of thirty patients treated at the Massachusetts Eye and Ear Infirmary, twenty-six actually had metastasis after ligation.

In the past the treatment of thrombosis of the lateral sinus followed the hard and fast rules set down by the early pioneers. The internal jugular vein was ligated by some surgeons as the first step in the procedure and by others after the attack on the sigmoid; some followed the plan of Alexander, by exteriorizing the vein, after its section.

More recently, various surgeons, e. g., Mygind, Rott and Dixon, advocated nonligation of the internal jugular vein. Thus there are two schools of thought.

Recently, in speaking on this subject before the Ear, Nose and Throat Section of the Pennsylvania State Medical Society, in October 1935, we [4] described our procedure as follows:

> In the course of our experience with many of these cases, we have formulated the following flexible rules to help guide us. The lateral sinus is always first to be attacked. If an occluding thrombus is found that can easily be removed and free bleeding is obtained from both ends, then the lateral sinus is merely blocked by packing and nothing is done to the internal jugular vein.
>
> If after incision of the lateral sinus phlebitis is found without a thrombosis, the sinus is obliterated and no treatment is given to the jugular vein. If a thrombus is found in which bleeding from the lower end cannot be obtained, we are then confronted with several problems. In mild cases without local signs in the neck, the thrombus is not disturbed nor is the jugular vein ligated. In a case with severe septicemic symptoms, presenting local physical signs in the neck indicating an extension of the thrombotic process downward, the internal jugular vein was always ligated.

At present we are not concerned with producing free bleeding at the time of the surgical attack on the lateral sinus when an occluding thrombus is present. In such cases we do not attempt thrombectomy, nor do we remove the diseased sinus wall. We merely incise the lateral sinus and institute drainage.

Our reasons for these changes in therapy are based on clinical anatomic and physiologic facts which we shall attempt to enumerate. The anatomy of the cranial venous sinuses is well known. We shall mention only several important features that are germane to this dis-

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Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

1. Rott, O. M.: Why Ligate the Jugular in Cases of Lateral Sinus Thrombosis? Arch. Otolaryng. **14**: 272-281 (Sept.) 1931.

2. Coates, G. M.; Ersner, M. S., and Persky, A. H.: Lateral Sinus Thrombosis with a Review of the Literature, Ann. Otol., Rhin. & Laryng. **43**: 419 (June) 1934.

3. Meltzer, Philip E.: Treatment of Thrombosis of the Lateral Sinus, Arch. Otolaryng. **22**: 131-142 (Aug.) 1935.

4. Ersner, M. S., and Myers, David: Outstanding Signs and Symptoms in Sinus Thrombosis, Pennsylvania M. J. **39**: 579-585 (May) 1936.

cussion and will include a description of the areas drained by the lateral sinus and a description of the collateral circulation.

The intracranial structures drained by the lateral sinus have recently been well described by Nielsen and Courville,[5] from whose article the following sentence is quoted: "The countless number of tributaries from every portion of the cranial cavity and its contents which flow into the lateral sinus are factors which must be remembered, since these traverse the subarachnoid and subdural spaces and potentially expose these spaces to infection when the lateral sinus becomes infected."

Connecting the cranial venous sinuses with the systemic circulation are the emissary veins, the mastoid, parietal, occipital and condyloid. In addition, the sinuses communicate with the superficial circulation through the vertebral veins, the ophthalmic veins, the middle meningeal veins, the pterygoid plexus, the basilar plexus and the carotid plexus.

This hasty review will serve to illustrate the intercommunication of the dural venous sinuses with the general and intracranial circulation and the pathways through which infection may spread despite ligation and obliteration of venous structures.

Our next consideration is the essential physiology, as well as the pathologic physiology, of the lateral sinus.

The essential physiology is well summarized by Nielsen and Courville:[5]

> The lateral sinus carries the greatest portion of venous blood from the intracranial spaces through the jugular bulb into the jugular vein. Since these channels and their afferent veins are without valves the venous outflow is quite direct. The flow, however, is under negative rather than positive pressure in the system. The venous blood is pumped out of the skull by the action of the heart rather than evacuated by the force of gravity alone. The flow is also slowed by the numerous bends, twists and angulations in the course of the venous channels. It is also interfered with by the trabeculations which run across the lumens of the larger sinuses. In the case of the superior longitudinal sinus, the blood has to ascend when the body is in the erect position and also against the inflow from the superior cerebral veins.
>
> The lack of actual valvular obstruction makes it possible for the blood current to be entirely reversed within the system under certain conditions. As a result of coughing, straining or vomiting, the current may be temporarily reversed, an alteration which is favored particularly by the presence of the inferior anastomotic veins which permit the backing up of the blood from the region of the genu directly to the dorsolateral surface of the cerebral hemisphere.

In case of complete obstruction by pressure from a thrombus, reversal of the current may be responsible for retrograde thrombophlebitic changes, which may account for many of the distant complications of infection of the lateral sinus. This view is held by many. Dixon[6] stated that extension of the thrombus is always retrograde and that ligation is therefore an unnecessary and illogical procedure. Stone and Berger,[7] in a study of primary thrombosis of the internal jugular vein due to suppurative processes in the neck, observed that the extension of the thrombophlebitis is toward the periphery, i. e., toward the skull, or retrograde.

Since the extension of the infection is retrograde rather than downward, it is evident that ligation of the jugular vein is superfluous, because such ligation does not completely eliminate collateral circulation or prevent retrograde infection. The protective element is the thrombus, whether it is retrograde in the lateral sinus or its tributaries, not the ligation or the thrombectomy, because the final outcome of thrombectomy and ligation of the jugular vein is a thrombus which in itself may become retrograde.

The basis of thrombus formation is the response of the endothelial tissue of the vein to an irritant—mechanical, bacterial or toxic. Other factors operative are slowing of the circulation and deposition of fibrin. The thrombus may form as the result of direct extension through the venules, as with hemorrhage in the mastoid, or by pressure of infectious material, as with perisinuous abscess. The latter type of formation often occurs with coalescent mastoiditis.

A thrombus is therefore a physiologic protective mechanism having a pathologic basis for its formation and is nature's response to any or all of the factors enumerated. We have therefore come to regard it with a friendly attitude, because it is nature's response to a potential danger, and it is an important protective element in the line of defense. Rott[1] stated: "Thrombosis is a protective mechanism, nature's method of preventing the spread of infection."

Kopetsky[8] said: "Thrombosis per se is regarded as a defensive mechanism, nature's effort to circumscribe our infection entering the blood stream through the wall of a vein."

Boyd[9] stated that "the thrombus is beneficial as the thrombotic process which occludes the vessel usually succeeds in keeping ahead of the liquefaction process which renders the clot so dangerous, so that there may be a considerable area of liquefied clot in the vessel, a veritable abscess, which is, nevertheless, securely shut off from the general circulation by the thrombus."

On the other hand, we have observed that in the fatal cases of lateral sinus phlebitis, with septicemia, there was no attempt at thrombus formation.

One must therefore reappraise the thrombus from a protective physiologic standpoint rather than consider it a pathologic foreign body. One must emphasize that the thrombus is nature's method of protecting the individual. When the thrombus is incompletely formed, septicemia, bacteremia and emboli are the result.

TREATMENT

In view of the fact that the thrombus is considered a protective agent, the treatment should be expectant, with careful observation before the vein is attacked surgically. Many cases of phlebitis or thrombosis subside under conservative treatment. It is a well known fact that a thrombosed but uninfected lateral sinus does very little if any harm. Day[10] reported six cases of spontaneous cure of unrecognized thrombosis of the lateral sinus accidently discovered during operation.

Richards[11] stated: "There are the numerous cases of symptomless thrombosis discovered by chance during a mastoid operation, indicating that at times at least nature is quite capable of walling off an infection in the vein without any help from the surgeon. On this

5. Nielsen, J. M., and Courville, C. B.: Intracranial Complications of Otogenous Thrombosis of the Lateral Sinus, Ann. Otol., Rhin. & Laryng. **46**: 13-38 (March) 1937.

6. Dixon, O. J.: Newer Conceptions in Management of Septic Sinus Thrombosis, Laryngoscope **44**: 448-453 (June) 1934.

7. Stone, F. E., and Berger, M. D.: Retrograde Sinus Thrombosis Complicating Primary Thrombosis of the Jugular Vein, Arch. Otolaryng. **24**: 141-158 (Aug.) 1936.

8. Kopetsky, S. J.: Acute and Chronic Otitis Media and Sinus Thrombosis, Arch. Otolaryng. **10**: 302-313 (Sept.) 1929.

9. Boyd, William: Surgical Pathology, Philadelphia, W. B. Saunders Company, 1925, p. 565.

10. Day, E. W.: Report of Spontaneous Cure of Six Cases of Unrecognized Lateral Sinus Thrombosis Accidently Discovered During Operation, Laryngoscope **25**: 757, 1915.

11. Richards, Lyman: The Pros and Cons of Jugular Ligation in Lateral Sinus Thrombosis, Kentucky M. J. **33**: 351 (Aug.) 1935.

fortuitous help, of course, one could never safely rely, but it indicates that thrombosis in and of itself does not necessarily lead to septicemia."

We shall divide our treatment of lateral sinus involvement into the medical and the surgical phase.

Medical.—The medical treatment is primarily concerned with the septic symptoms that the patient manifests. The transfusion of whole blood is probably one of the most important single modes of therapy we can mention. Transfusions of whole blood are given daily or on alternate days. The amount of blood administered is small. To children we give from 1.5 to 2 cc. per pound (0.5 Kg.) of body weight. The transfusion should be guided by the temperature and by frequent hemograms. Small and frequently repeated transfusions act to stimulate formation of antibodies.

In addition to transfusions of whole blood, whenever practicable or available immunotransfusions, specific or nonspecific,[12] may be used. These also are given in small amounts and at frequent intervals.

The use of specific serum when available should be instituted. Dick's antiscarlatinal serum has been a useful adjuvant in some cases.[13] Forced feedings, tonics and ultraviolet irradiation are of value. Symptomatic treatment is given as indicated.

Chemotherapy: During the past year the use of sulfanilamide (para-amino-benzene-sulfonamide) has attracted considerable attention. Since most cases of thrombosis of the lateral sinus are of streptococcic origin, this drug should be of great value. The literature is full of glowing reports concerning its use.

The use of quinine dihydrochloride in the presence of chills, given in frequent doses until the patient complains of tinnitus aurium, occasionally yields beneficial results.

In the presence of generalized septicemia, a fixed abscess, specific or nonspecific, may aid in clearing the organisms from the blood stream. The nonspecific abscess may be produced by the injection of an irritating substance such as turpentine. The specific abscess is induced by injecting attenuated organisms obtained from the host.

Surgical Treatment.—The first step in the surgical attack is to eradicate the focus or the source of the infection. (*a*) If symptoms suggesting sepsis are present in cases of otitic infection, immediate mastoidectomy should be performed and the lateral sinus exposed for further study and observation. In the meantime, expectant treatment is instituted. (*b*) If septic symptoms indicative of involvement of the lateral sinus occur after mastoidectomy, then the mastoid should be revised and the sinus exposed for inspection. In many instances we are unable to judge the contents of the vessel from its external appearance. It therefore becomes necessary to inspect the interior of the vessel. Our procedure in all instances is not to ligate the internal jugular vein as a preliminary step. The sinus is packed above and below and is then incised. If free bleeding is obtained from both ends of the sinus we repack in order to control the bleeding.

We feel that by packing we produce a "man made" thrombus which seems to limit the infection. This accomplishes what nature failed to do: if the vein is obliterated above the point of infection, the packing will produce the thrombus, and if this new thrombus is sterile, recovery follows.

Incomplete or mural thrombosis is treated in similar manner as phlebitis. The vein is occluded by packing, and the patient is treated expectantly. In cases of complete thrombosis without bleeding after incision of the sinus, we do not attempt to remove the thrombus or produce free bleeding. We insert a piece of rubber tissue or iodoform gauze as a drain and then proceed with the supportive treatment. It is not essential to remove the thrombus or to excise the wall of the sinus, because when this is done the sinus must be obliterated. Healing depends on the formation of another thrombus (man made), which may or may not be sterile. It must be remembered that the act of thrombectomy may destroy the protective barrier that nature has introduced. In the past we have observed many cases in which we were unable to dislodge the thrombus from the lower end of the lateral sinus and produce free bleeding. Rather than subject our patients to a difficult operation on the jugular bulb, we allowed the thrombus to remain and did not ligate the internal jugular vein. The patients made uneventful recoveries. It was this observation that led us to feel that when the thrombus is firmly fixed no benefit can accrue from its removal.

If on incision of the lateral sinus an abscess is observed, we insert drainage. This procedure was recently recommended by Maxwell.[14] Three such cases were encountered by my associates Drs. Ball and Mitchell during the past few months. In each of these cases an abscess had perforated through the anterior wall of the lateral sinus. The only surgical therapy instituted was incision and drainage supplemented by supportive treatment. All the patients made an uneventful recovery. If the septic symptoms continue and physical signs evidence involvement of the internal jugular vein, then the vein is exposed and incised and drainage is instituted. We do not ligate, resect or exteriorize.

By following the surgical principles as outlined, we promote drainage, which after all is the primary surgical dictum. But we avoid meddlesome surgical intervention that might break up protective barriers. Sixteen cases were treated without ligation of the internal jugular vein, as follows: (*a*) four cases of central liquefaction of the thrombus, (*b*) three cases of phlebitis, (*c*) four cases of complete thrombosis of the jugular end of the sinus, (*d*) one case of mural thrombosis and (*e*) four cases of complete thrombosis in which no bleeding occurred from either end.

CONCLUSIONS

1. Thrombosis is a protective process.
2. Ligation of the internal jugular vein is not a panacea in the treatment of infection of the lateral sinus.
3. Ligation of the internal jugular vein does not prevent metastasis, embolism or septicemia.
4. Treatment of infection of the lateral sinus is primarily medical and partially surgical.
5. The surgical principle is the institution of drainage and the avoidance of over manipulation.
6. Thrombectomy is not indicated when the thrombus is firmly fixed.

12. Ersner, M. S., and Myers, David: Treatment of Lateral Sinus Phlebitis, Thrombosis and Otitic Septicemia with Nonspecific Immunotransfusions, Laryngoscope **44**: 363 (May) 1934.

13. Ersner, M. S.: Treatment of Lateral Sinus Thrombosis with Dick's Antiscarlatinal Serum, Laryngoscope **40**: 758-759 (Oct.) 1930.

14. Maxwell, J. H.: Thrombosis of the Sigmoid Sinus, Arch. Otolaryng. **25**: 184-189 (Feb.) 1937.

7. The internal jugular vein should not be ligated when infection is present, but drainage should be instituted by means of incision.

8. Ligation is not the crux of the situation.

9. Recovery depends on the resistance of the host and its protective elements; according to our experience the thrombus is one of the mechanisms in the line of defense.

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ABSTRACT OF DISCUSSION

DR. H. MARSHALL TAYLOR, Jacksonville, Fla.: The treatment of lateral sinus thrombosis has developed more divergent opinions and animated discussions in the past than any other subject in otology. The authors tell us that two schools have arisen. One opposes the ligation of the internal jugular vein while the other school advocates ligation. The two schools seem to agree on other phases of treatment; that is, as to complete mastoidectomy, inspection of and attack on the sinus, transfusions of whole or immunized blood and chemotherapy. Infection of the lateral sinus is potentially a serious condition to deal with, owing principally to the number of tributaries of the vein and the intercommunication of the dural venous sinuses and the intracranial circulation as reviewed by Drs. Ersner and Myers. Even though infection may be carried through other channels, one cannot disregard the fact that the internal jugular vein does carry the major portion of the venous blood from the cranium into the general circulation. After all other treatment has been carried out and there is evidence of continued sepsis and advancing infection, I feel that ligation of the vein may be a valuable adjunct in the treatment of this condition. The authors report some astounding statistics. Had they stated at what period of the disease ligation of the vein was performed, I feel that these statistics would be of greater value. They cite one author who reported seventy-four deaths after 132 ligations. If these were eleventh hour ligations and after general septicemia had occurred, it seems to me that these statistics have little significance in condemning ligation of the vein. I am not surprised that with a mortality of 56 per cent this author abandoned one phase of mastoid surgery. The authors quote another author who reported twenty-six cases out of thirty as showing a metastasis after ligation. I cannot but wonder whether these cases were not late ligations. These unexplained statistics impress me as more argumentative than convincing. I wish to commend the authors on their well prepared paper. I agree that it is only by exchange of ideas and comparison of methods employed that the treatment of this dangerous complication will some day be settled to the satisfaction of all.

DR. MARVIN FISHER JONES, New York: An old subject which has been settled satisfactorily to most competent surgeons has again been exhumed. This subject has been discussed recently, and the discussions have been supported by plausible argumentation. Notwithstanding this plausibility, it is known that they are wrong. There is no major surgical procedure used to cure serious illness which in experienced hands produces a higher percentage of favorable results. The only serious impediment results not from the established operation but from temporizing. Patients with septic sigmoid sinus thrombosis frequently died before the sinus and jugular operation was perfected. Now they rarely die. This statement is substantiated by the reports of any reputable institution. Transfusion is a valuable preoperative and postoperative method of treatment. In some cases a cure has resulted from transfusion. On the other hand, the dependence on transfusion has resulted in fatal procrastination. Two successive patients under my observation died probably as the result of nonligation. Within the past two years I have had one patient who was growing progressively worse following an operation without ligation and who recovered following a second operation to ligate the jugular. The second in this period in which the vein was not ligated had a greatly prolonged period of convalescence. A third received intravenous vaccine and bacteriophage, which so complicated the usual course of convalescence that I was at a loss to know what to do. A fourth went through a similar agonizing fate. My day of altering a most satisfactory method of surgery in septic sinus thrombosis is past. Nonligation has a place in a few very carefully selected cases. The choice of such a procedure calls for fine discrimination resulting from critical experience. A properly performed operation which includes vein ligation should still be the rule, and nonligation a carefully weighed exception.

DR. PHILIP E. MELTZER, Boston: Dr. Ersner has for years included the ligation of the jugular vein as part of the surgical treatment of lateral sinus thrombosis. He has reconsidered the rationale of this procedure and questions the necessity of including ligation of this vein. He goes so far as to question the advisability of disturbing the thrombus in the lateral sinus. His present treatment is based on anatomic, physiologic and clinical facts. It is a frank declaration appealing for unbiased consideration of these facts. He asks that each case be considered as an entity and states that the treatment should be dependent on the symptoms and local conditions found at operation. His procedures are offered as the best means of assisting the patient to cope with the infection. When symptoms point to meningeal irritation due to an infected thrombus lying in contact with the medial wall, I prefer to remove the clot. When the symptoms are manifestly those of sepsis, I eradicate all bone over the sinus from beyond the knee, practically to the bulb. I also remove any suspicious outer wall of sinus and infected clot, if present. Should the clot continue to break down, I do not hesitate to go back in my daily treatment of the wound to remove it. I firmly believe in getting rid of all locally infected material. In those cases in which a clot is present and breaks down in the region of the bulb, or if free pus wells up from the bulb, and from the symptoms it appears that the infection is descending, I do not hesitate to open into the neck, ligate the jugular vein, and sever it. All tributaries above the tie are also ligated and severed. Somewhere between the extremes of ultraconservatism and radical therapy is the type of treatment which will be appropriate for the majority of cases. As I see it, the principles of treatment as stated by the authors is that happy medium. I should like to make a correction about the number of cases stated with metastasis. There were 151 cases of ligation of the jugular between the years of 1921 and 1932 at the Massachusetts Eye and Ear Infirmary. All were treated by ligation of the jugular vein and local treatment to the lateral sinus. Of that number there were two series. I divided them in six years each. In series 1 there were fourteen and in series 2 thirty in which metastasis developed. Metastasis developed in nine after ligation and in five before. In twenty-six in series 2 out of the thirty, metastasis developed after ligation. This doesn't mean anything more to me than the fact that ligation does not prevent metastasis. It still is one of the most dangerous complications of otitis media, and 2 and 3 per cent fatality as reported by a previous surgeon falls too far below other reports. His may be a personal series, but the average in a large hospital clinic is somewhere between 20 and 30 per cent.

DR. ISIDORE FRIESNER, New York: It is a well known fact that in cases of sepsis from sinus thrombosis a section of the jugular shows streptococci in the walls of the vein. The sepsis is not due to the thrombus; it is due to the phlebitis, the phlebitis that invades the intima. One may have a phlebitis up here, and another one away down in the jugular. It is believed by all that thrombus is nature's method of protecting the individual from this disease. This was told by Aschoff when he first described the physical mechanism of the formation of a thrombus. But has it been forgotten that 25 per cent of cerebellar abscesses are due to infected thrombi? This isn't a clot. It is a thrombus, and there is an essential difference between them. It isn't a question of tying or not tying without regard to the pathologic changes. It must be remembered that bacteremia is due to the phlebitis and not to the thrombus. The thrombus is a protective mechanism until it becomes infected. There may be a phlebitis, with bacteremia resulting without any gross changes, those that can be picked up and looked at and determined at operation. Finally, it must not be forgotten that 25 per cent of cerebellar abscesses are due to infected thrombi, and it is not right to toss them off and say that one never touches the thrombus.

DR. J. I. KEMLER, Baltimore: My experience has been different from the sad picture portrayed by the authors. In twenty-five years of practice I have seen about fifty cases of lateral sinus thrombosis. My routine has been as follows: In patients, after mastoidectomy, who have a chill with a rise in temperature to 104 F. or over, with an abrupt drop to normal and a repetition within twelve to twenty-four hours with no other cause to account for it, whether the blood culture is positive or negative, I immediately tie off the jugular vein and open up the lateral sinus widely until free bleeding is obtained from both ends. Results have been excellent and I cannot remember having lost more than three or four cases of the entire series, including chronic as well as acute mastoiditis. Dr. Harry Friedenwald in 1910 reported two cases in which he found a fistula in the lateral sinus, showing the attempt of nature to bring about drainage from the infected sinus. I have found walled off abscesses in the lateral sinuses when operation has been delayed, and in one case it was found at autopsy. In the last year I have tried to be conservative. One case of lateral sinus thrombosis with positive blood cultures was treated conservatively with transfusions and other supporting measures. The patient lingered on with a temperature of 105 or 106 F. for four or five days and showed no improvement until the jugular vein was ligated and the lateral sinus opened. The blood culture taken twenty-four hours after the operation proved to be negative and the patient made an uneventful recovery. My second case I saw recently. Sulfanilamide was used here in full doses together with other supporting measures. The temperature was normal after the first chill and fever of 105 F. and then remained normal for five days. After that there was another chill and a rise in temperature to 105 F. Another course of sulfanilamide together with other supporting measures and blood transfusions was kept up constantly. Sulfanilamide was given until the patient became cyanosed, after which her temperature remained normal for one week. She then had two chills and fever in one day. I then ligated the internal jugular vein and opened the lateral sinus. After a stormy course the patient got perfectly well. These two cases show that the old orthodox method of treatment of lateral sinus thrombosis cannot be abandoned.

DR. MATTHEW S. ERSNER, Philadelphia: I thank my colleagues for their discussion. Most cases of sinus thrombosis or phlebitis are not emergency operations. I have learned that one can temporize with little difficulty. In many stormy cases in which I thought that there would be a great deal of pathologic change, little was found. These patients recovered rapidly after obliteration of the lateral sinus because the production of a thrombus helped nature along. No matter how well one knows the macroscopic pathology of the lateral sinus, it is difficult to judge the contents of the vessel. Exploration is therefore necessary. We do not ligate the internal jugular vein as a primary step. We usually incise the lateral sinus and if there is free bleeding from both ends we obliterate the vessel. If an abscess is found, we evacuate it without disturbing the thrombus. When a thrombus is found, we incise and institute drainage but do not disturb the thrombus. It is a well known fact that one of the complications in obstetric practice is phlegmasia alba dolens. The obstetrician does not rush into performing a radical operation. The very same principle applies in our field. When meningeal symptoms are present we remove the thrombus and excise part of the anterior wall so that we may inspect the visceral portion of the vessel. We are not convinced that thrombectomy and internal jugular ligation is the therapeutic panacea. We have treated sixteen cases in the manner described. One case in this series began with a lobar pneumonia, and an otitis media, mastoiditis, septicemia and thrombosis of the lateral sinus with an abscess developed. In this case, we emptied the lateral sinus and obliterated it; we also exteriorized the internal jugular vein and, despite modern surgical methods and therapeusis, the patient succumbed. We believe that the thrombus should not be disturbed and that drainage should be instituted when pus is present. Many complications, including embolic phenomena, are due to the disturbance of the thrombus. We believe that our method holds greater hopes in combating lateral sinus thrombosis and we therefore present it for consideration and trial.

RIGHT COLECTOMY FOR MALIGNANT DISEASE

A DISCUSSION OF THE MORTALITY ASSOCIATED WITH VARIOUS OPERATIVE PROCEDURES

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Right colectomy is technically an easy procedure. After the practically bloodless lateral peritoneal attachment is freed, the bowel, with an almost transparent mesentery, delivers mesially in such a fashion as to make its removal a simple matter. The gland-bearing area can safely be included in the dissection, the terminal ileum and transverse colon being left adequately supplied with blood vessels at convenient levels for suitable anastomosis. The slow development of cancer in the right colon, with its tendency to remain localized, makes that location a particularly favorable site for cure.[1] In spite of these facts, statistics show that, in the Massachusetts General Hospital, at least, the operative mortality is slightly higher for right colectomy for cancer than for extirpation of similar lesions in the left bowel. It seems reasonable to feel that greater consideration should be given the right colon, where the disease is less frequent and in connection with which the experience of any one surgeon consequently develops more slowly. The patient less often has obstruction, and thus the necessity of preliminary drainage does not present itself so regularly. The simplicity of resection aids in the temptation to subject these patients to a radical one stage operation.

The purpose of this study is to discuss the various factors associated with operative procedures on the large bowel in an effort to offer, if possible, some suggestions that may help in reducing the mortality. One is at once confronted with many confusing and complicated matters bearing on the subject in general. Various opinions regarding the choice of operation have hitherto been held. One group of surgeons feel that a one stage procedure should be done in the majority of cases[2] and offer good arguments to support their views. Others feel that the Mikulicz type of resection is the safest method of bringing about a successful end result.[3] Still another group feel that some form of two stage operation should always be used.[4] Considerable reliance has been placed on various technical procedures, the entire success often having been credited to the proper preparation of the patient before operation, preliminary intraperitoneal vaccination, the anesthetic used or the type of anastomosis made. That there may be value in all these various points in the hands of one surgeon or another cannot be disputed. However, no one can set down a series of rules which every surgeon can follow to a successful outcome. Certainly, one surgeon may work out a system that in his hands produces better results than would follow the same procedures carried out by another surgeon. Thus, one must look at the question with an open mind, admit the failure of one's

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2. Harvey, Samuel C.: The One Stage Operation for Resection of the Cecum and Proximal Colon, New England J. Med. **211**: 1038-1042 (Dec. 6) 1934.
3. Lahey, Frank H.: Resection of the Right Colon and Anastomosis of the Ileum to the Transverse Colon after the Method of Mikulicz Plan, New England J. Med. **206**: 315-319 (Feb. 18) 1932.
4. Rankin, Fred W.: Surgery of the Colon, New York, D. Appleton & Co., 1926.

pet ideas, if such exist, and strive to fit into the plan of management all the known aids that have proved useful to others, provided there is any reason to feel that the mortality could be lowered. To clarify existing ideas concerning the treatment of cancer of the right bowel, it seems justifiable to consider the subject on a comparative basis with similar lesions in other sections of the colon, where the disease is more common but has a less favorable prognosis and is technically more difficult to treat.

Regardless of details, certain definite general principles dealing with cancer of the bowel are now generally accepted. These cannot be ignored, regardless of any less important adjuncts in which one may have faith. Although it is unlikely that any of these more important factors are wilfully neglected, it can do no harm to set them down.

PREOPERATIVE PREPARATION

The patients come to the surgeon in all stages of health, from the phase of almost no interference to that of full blown general peritonitis from perforation. Obstruction, anemia and depletion are often present in varying degrees. Each patient must be considered on the basis of operability, whether this is dependent on the lesion itself, complications secondary to the primary growth, associated diseases or age. A considerable proportion arrive at the hospital in a hopeless state. In cases of perforation of the bowel either at the growth or proximal to it, even a palliative procedure can rarely be carried out successfully. Patients with acute obstruction should have an early preliminary drainage of the bowel, by cecostomy or colostomy for lesions distal to the hepatic flexure and by ileotransverse colostomy if the growth is in the cecum or the ascending colon. Ileostomy as a preliminary operation for drainage is not recommended, owing to the high incidence of peritonitis following its use and to the complications it brings about when one wants at a later date to get at the primary area to be resected.

Cecostomy usually suffices as a preliminary procedure in cases of acute obstruction by any lesion beyond the hepatic flexure and should not be delayed, since local necrosis due to distention of the cecum will bring about perforation in a comparatively short period.[5] This operation is useful as a first stage to resection of the left bowel in the presence of partial obstruction or even if no obstruction exists. Although it does not eliminate the cramplike discomfort that accompanies the lesion of the left bowel, it does diminish it sufficiently in the majority of cases to allow the proper intake of food and fluids by mouth preliminary to resection of the primary growth. Also, it makes a valuable safety valve proximal to the suture line after the resection, thus eliminating the necessity of including this operative step at the time the growth is resected.[6]

Colostomy proximal to the obstruction in the left bowel is much desired by many surgeons. I grant that it relieves the obstruction more satisfactorily than cecostomy and makes the patient more comfortable at an earlier date. It does complicate future procedures, however, and I have rarely found it sufficiently superior to cecostomy as a preliminary to radical operation to warrant its use.

Depleted patients should be brought into a more normal state of physiologic balance prior to resection of the bowel. In addition to administering water, chlorides, dextrose and blood, one must take advantage of more recent research along the line of deficiency diseases in general. Without doubt, the tendency for wounds to heal poorly and patients to withstand operation badly can be remedied to a large extent by the preliminary and coincident use of vitamins. Certainly, the striking improvement in some of these patients following the use of cevitamic acid[7] and the intramuscular injection of liver extract is worthy of consideration.

My experience with intraperitoneal vaccine has been too limited to warrant discussion. I have the very distinct feeling that part of the benefit derived from any two stage procedure on the large bowel may come through the added resistance that the peritoneal cavity attains after the less radical preliminary stage. This may not be true, since it has not been established at what time after exploration or inoculation the peritoneal cavity reaches its maximum immunity. The time varies in the estimation of different workers from twenty-four hours to six weeks. The smoothness of convalescence of the average patient who has had a preliminary drainage or short circuit from seven to fourteen days previous to resection of the large bowel, as compared to the often stormy postoperative course following the same operation done in one stage, has been observed by every surgeon who has had experience in this field.

Anesthesia continues to offer opportunity for argument whenever the subject is introduced. Every surgeon must select for himself the type of anesthesia he can best use under the circumstances in which he works. More important than the type of anesthesia is the person who administers it. A properly controlled patient, regardless of the agent used, is really the most important feature of anesthesia. A technic must be used that eliminates pain, cyanosis, marked changes in blood pressure and damage to parenchymatous organs and minimizes postoperative complications in the respiratory tract. I myself prefer a well given intratracheal gas-oxygen-ether mixture in a closed machine, although I have had many satisfactory spinal anesthetics administered.

ELIMINATION OF DISEASED AREA

If a lesion of the large bowel is operable, the disease is not necessarily still confined to the bowel itself. Although the percentage of cures is low when lymph nodes are involved in the process, enough patients do not have recurrence after radical operation under this circumstance to warrant including the mesentery in the resection. One cannot assume that, if the lymphatics in the immediate vicinity of the growth are involved, only a local resection of the bowel itself or even a more palliative proximal colostomy or short circuit is all that is worth doing. One should remove all the obvious diseased material, provided such a procedure is compatible with an early good result. When the mesentery is not grossly invaded, it is even more important to remove it. Too many resections of the large bowel include no mesentery at all, and such resections unfortunately are apt to be done in cases in which a permanent cure might have been effected. I believe it is more important to remove as much mesentery as is consistent with the supply of blood to the remaining part of the colon than it is to have the specimen contain a long section of normal bowel on either side of the growth. Lymphatic involvement in the right colon is very apt to be limited to the easily spared right colic vessels.

5. Sperling, Louis: Rôle of the Ileocecal Sphincter in Cases of Obstruction of the Large Bowel, Arch. Surg. **32**: 22-45 (Jan.) 1936.
6. Jones, Daniel F.: The Diagnosis and Principles of Treatment of Carcinoma of the Colon and Rectum, Tr. Am. S. A. **49**: 308, 1931.
7. Lanman, Thomas, and Ingalls, Theodore H.: Vitamin C Deficiency and Wound Healing, an Experimental and Clinical Study, Ann. Surg. **105**: 616 (April) 1937.

The dissection should be carried well on to the transverse colon, as this structure is so well supplied with anastomotic blood vessels that malnutrition of the remaining bowel is unlikely. This is not true in certain areas of the sigmoid, and careful attention to an adequate blood supply must be given. Certain knowledge of the normal blood supply must be borne in mind; I feel, however, that it is more important to use one's power of observation in determining the viability of the intestine that is to undergo anastomosis. One can rarely fail to recognize cyanosis or lack of pulsating vessels if one looks for them.

One is often justified in removing the local growth and its immediate glandular involvement even in the presence of distant metastasis. The best operation for an obstructing lesion of the bowel is resection with anastomosis regardless of the extent of the disease. Patients with known metastasis have lived comfortably for a number of years after such a palliative resection. This attitude has a tendency to increase one's operative mortality, but the patients who survive will be much happier for the remaining months of their lives.

Gross contamination should be avoided during the operative procedure. The most frequent technical error in surgical procedures on the large bowel is gross soiling of the peritoneal cavity or the retroperitoneal tissues with contents of the bowel. Such soiling usually comes about by the slipping of a clamp or basting stitch and occurs most frequently when the operator is inexperienced or the patient is improperly prepared owing to incomplete cleansing of the bowel preoperatively or failure to institute preliminary proximal drainage. The peritoneal cavity will withstand a considerable amount of contamination but not often gross soiling with spilled fecal matter. This is particularly true if the content of the bowel is liquid, since in this case the tissues not covered by peritoneum, such as the cut mesentery, with its fatty padding, or the retroperitoneal spaces, may be contaminated. From this area, infection is prone to spread with appalling rapidity. Any type of operation or number of stages used is justifiable if this catastrophe can be avoided. Aside from so-called accidental contamination, there is frequently too little regard for the consequences of an open anastomosis in the large bowel. It is frequently stated that a well protected operative field will allow an open anastomosis to be done with safety. This argument is based on the fact that the peritoneum will take care of a certain amount of soiling. The champions of the open anastomosis defend it not only on this basis but on the claim that they can be more certain of the blood supply and the function with such an anastomosis than with any of the so-called aseptic methods of suture. Most of this argument is true, and certainly in the hands of some operators an open anastomosis can be successfully accomplished in a creditable percentage of cases. It is true also that the patients more often have stormy convalescence owing to residual abscesses, sepsis of the wound and intestinal obstruction than do those that are operated on with a more nearly aseptic technic. Also, in the hands of some surgeons there is a high percentage of fatal peritonitis. One may argue that this complication is not due to the soiling that takes place during the operation but to a leaking suture line. This is not always the case, as the suture line is often found intact at autopsy when general peritonitis has been the cause of death.

A leaking suture line will almost invariably result in fatal peritonitis unless the leak is of slow development, resulting in an abscess formation that, when drained, ends in a fecal fistula, under which circumstances recovery may take place. There are certain points regarding the suture on which all authorities agree, such as the necessity of adequate blood supply, the prevention of distention within the bowel proximal to the anastomosis, an accurate apposition of the serous coats without eversion of the mucosa, the absence of strain or tension on the line of sutures and the allowing of no foreign body, such as a drain, to rest near it. If these general principles are carried out the anastomosis will heal and will not leak. The type of suture material is unimportant, provided it is of a character to resist absorption for a few days and is not tied so tightly that the tissues will be rapidly cut through.

Denuded areas must be peritonealized. The careful elimination of raw surfaces following any abdominal operation brings about such gratifying results that one should exert every reasonable effort in this direction. In the radical extirpation of extensive malignant disease, this ideal refinement of technic cannot always be carried out, but usually it is possible to reduce the danger of postoperative obstruction to a marked degree. The cut edge of the fat-lined mesentery is a frequent site for the adherence of a loop of small intestine, and one can afford any amount of pains to avoid this complication. Traps must be carefully closed. I have seen several instances of failure in an otherwise well resected lesion due to inadequate closure of apertures through which a loop of small bowel may pass and produce obstruction. Such failure most often occurs in the V-shaped resection of the mesentery after the anastomosis is made or in the lateral gutter after an end colostomy. It is certainly worth while to close the space between an end colostomy and the parietal peritoneum, particularly if the bowel is brought out anteriorly. One may damage the supply of blood to the bowel if one accomplishes this carelessly or leaves a small trap, which is more dangerous than a large one, but these arguments do not offset the fact that a more ideal situation can be established if care is used. Too often, I have seen undue confidence placed in the use of omentum to cover unperitonealized defects. The value of this structure cannot be minimized, but if it is traumatized, like any other tissue containing fat, it may prove to be a boomerang, since nature will cast off unnourished cells and in the process of repair an abnormal point of attachment for a loop of the small bowel occurs.

POSTOPERATIVE CARE

Immediately after a resection of the colon, one should almost as a matter of routine give the patient a transfusion. This is important for other reasons than the loss of blood at operation or a fall in blood pressure. Blood may be looked on as the best intravenous food available, and the added resistance to postoperative complications afforded by this simple procedure cannot be overemphasized.

Special nursing for the first twenty-four hours, at least, after an operation of this magnitude will prove to be a good investment. Pulmonary complications can often be avoided by immediate and constant attention to details during this clinical period. The relative frequency of postoperative pneumonia in ward patients as compared to private patients in the Massachusetts General Hospital is very striking. Although other factors may be involved, I am certain that the nursing problem is a most important one.

Liberal use of morphine is desirable after any abdominal operation, particularly when known contamination, however slight, has taken place. Not only does it have the desired action of maintaining the tone of the bowel but it induces a state of sedation and euphoria, so that intravenous needles, the Levine tube and other discomforts are borne with greater ease. One's only guide as to the amount should be the rate of respiration. Morphine should be given regularly—"by the clock"—in doses commensurate with the size and condition of the patient. From one-eighth to one-fourth grain (0.008 to 0.016 Gm.) every three hours is usually well tolerated for forty-eight hours without ill effects. It is well to keep within limits that do not depress the respirations below 16 a minute. This drug diminishes the amount of distention within the bowel and maintains a slow, regular peristalsis in a satisfactory fashion.[8] I believe that morphine is superior to extracts of the pituitary gland on the basis of its soothing action and the less vigorous and more lasting effect on the tone of the bowel.

TABLE 1.—*Carcinoma of the Large Intestine, from 1925 to 1936*

	One Stage Resection			Two Stage Resection		
	Cases	Deaths	Mortality	Cases	Deaths	Mortality
Right	73	15	20.5%	18	2	11%
Transverse	19	3	15.7%	12	2	16.6%
Left	96	19	20%	73	10	13.7%
Rectum	212	40	18.8%	150	19	12.6%
Total	400	77	19.2%	253	33	13%

Fluids are best maintained by the intravenous administration of dextrose and salt solutions. An inlying Levine tube will eliminate nausea by keeping the stomach empty. It is important to keep the lower segment of the bowel clean, and this is best done by the administration of a few ounces of physiologic solution of sodium chloride by rectum every four hours. The patient absorbs this fluid until about the beginning of the third postoperative day, after which a certain portion of the liquid will be siphoned back with gas and particles of feces. After this stage is reached, nourishment may be given by mouth and the dose of morphine diminished. One should be careful never to introduce enough salt solution by rectum at one time to distend the lower segment, and the amount should not be sufficient to flow up the suture line. After a low resection of the sigmoid 4 ounces (120 cc.) is sufficient; if the anastomosis is high more may be given, but never enough to produce a peristaltic cramp.

The diet during the early postoperative course should consist of foods which are not gas producing;[9] carbohydrates, fruit juices and milk should be withheld until there is free elimination of gas from the cecostomy or from the rectum. In the case of depleted patients, transfusions should be repeated and cevitamic acid administered. Liver extract administered intramuscularly is advantageous for some of these patients, particularly if they have difficulty in regaining a safe stage of nutritional balance. One should not overlook the advantages of iron given by mouth in convalescence.

CHOICE OF PROCEDURE

Statistical data cannot always be accepted at their face value. This seems particularly true in the analysis of the case records of carcinoma of the colon treated at the Massachusetts General Hospital from 1925 to 1936. During this period there was a definite tendency toward a one stage operation except in the presence of acute obstruction. Also, two stage procedures were often selected on the basis of the poor operative risk which had to be dealt with. The patients were operated on by a fairly large group of surgeons, each of whom based his operative procedure on a variety of individual impressions. New ideas were carried out for better or for worse. A tendency to subject a patient with extensive invasive disease, usually considered inoperable, to radical extirpation is evident. Training, development of various principles and a hope to accomplish the impossible all had a rôle in the mortality. One cannot help being impressed by the marked influence that the teaching of D. F. Jones has had on surgery of the colon in this clinic. This is most strikingly illustrated in the observation of only one fatal leakage of the suture line from deficient blood supply.

It is impracticable to divide the cases into groups according to the individual surgeons involved, as the figures would then be reduced sufficiently to have no statistical value at all. It is fair to say that one stage procedures and open anastomoses gave better results in some hands than in others. The type of anastomosis done, whether end to end, end to side or lateral, apparently had little bearing on mortality, while the more or less aseptic methods as opposed to open anastomoses are strikingly superior. This is particularly true of the Parker-Kerr[10] type of anastomosis, which was accompanied by far the lowest mortality in the entire series.

It is necessary to look at the figures for the entire group of resections of the large bowel to obtain any idea of the safety of a one stage as compared to a two stage procedure. In these data I have considered any preliminary operation that reduces the flow of intestinal contents through the involved segment, followed at a future time by resection of the lesion, as representing the first part of a two stage operation. Therefore preliminary short circuit, ileostomy, cecostomy, colostomy and first-stage dissections with colostomy have all been considered as first-stage procedures. The Mikulicz type of resection has been included in the one stage group unless it was preceded by cecostomy. Some patients with carcinoma of the rectum and rectosigmoid with obstruction had a preliminary cecostomy followed by a combined abdominoperineal operation at a future date—the second operation under these circumstances amounting to a one stage procedure. However, it seems fair to look on preliminary cecostomy in these cases as a first-stage operation, since otherwise the patient would have had to be previously relieved of his obstruction by some two stage plan. To be sure, about ten deaths followed a first-stage drainage operation when a two stage procedure had been hoped for. These

TABLE 2.—*Carcinoma of the Large Intestine, from 1925 to 1936: Average Stay in the Hospital*

	One Stage Resection, Days	Two Stage Resection, Days
Right	34	48
Transverse	42	52
Left	36	42
Rectum	31	43

8. Orr, Thomas G.: The Action of Morphine on the Small Intestine and Its Clinical Application in the Treatment of Peritonitis and Intestinal Obstruction, Tr. Am. S. A. **51:** 319-323, 1933.

9. Fine, Jacob, and Levenson, Walter: Effect of Foods on Postoperative Distention, Am. J. Surg. **21:** 184-283 (Aug.) 1933.

10. Parker, Edward N., and Kerr, Harry H.: Intestinal Anastomosis Without Open Incision by Means of Basting Stitches, Bull. Johns Hopkins Hosp. **19:** 132, 1908. Kerr, Harry H.: The Development of Intestinal Surgery, J. A. M. A. **81:** 641-647 (Aug. 25) 1923. Allen, Arthur W.: An Aseptic Technique Applicable to Gastrojejunocolic Fistula, Surgery **1:** 338 (March) 1937.

cases are excluded from the series as are all cases of palliative drainage or short circuit operation. It seems unlikely that any of these patients would have survived a radical one stage operation. One wonders in how many cases of a successful two stage procedure a radical one stage operation could safely have been substituted certainly in some, but on the whole during this decade the two stage operations represented the most serious risks in the group. The choice of operation was often limited by the condition of the patient on admission. In spite of this, in this series of cases there was a definite increase in safety with the two stage procedure which seems to offset the many desirable features of a single radical operation (table 1).

The increased number of hospital days in the two stage group is less than had been supposed (table 2). One cannot but feel that the added two weeks or less is justifiable in view of the overwhelming increase in safety. These patients realize that they are faced with a serious disease. It is not difficult to persuade them that two procedures may be necessary, and if they understand this beforehand they rarely object to a second trip to the operating room. This is particularly true if the first stage diminishes their previous discomfort or in itself is not uncomfortable. Frequently, much less reaction follows the more serious and time-consuming resection than the preliminary anastomosis. This may be attributed to a variety of reasons, such as tolerance, improved condition or intraperitoneal immunity. In addition, there may well be other unexplained factors. The smoothness of the average convalescence from a two stage operation as compared to that in many cases of a finally successful one stage operation, however, is very striking.

CAUSE OF DEATH

Peritonitis accounted for 30 per cent of all the deaths following resection of the large bowel (table 3). These represented 6 per cent of the 400 one stage operations and 3.5 per cent of the 253 two stage procedures. The majority of the deaths occurred in cases in which an open anastomosis was used. I have a definite feeling that this complication can be materially reduced, and any system that will lower its incidence is worthy of adoption. One cannot depend on a single principle, such as intraperitoneal vaccination or a two stage procedure. One must take into consideration the chief factor, and that is gross soiling.

Pulmonary complications such as collapse and pneumonia rank next in importance. Twenty-eight of the 110 deaths were attributable to these causes. It is interesting to note that the ratio of fatalities in the one and the two stage groups is distinctly in favor of the two stage procedure. This is in spite of the so-called double opportunity, which is often cited as an objection to the two stage operation. I believe that better anesthesia and better nursing are the important factors here, but one cannot overlook the fact that the two stage patients are in better condition to withstand their more serious second stage.

Intestinal obstruction is the next important fatal complication. Here there is a less marked contrast between the one and the two stage groups. Although the number of two stage operations on the right colon is too small for comparison, I feel that one may be justified in drawing the conclusion that obstruction will have a rôle in the mortality as the series increases in number. This brings to attention the necessity of obliterating raw areas and eliminating traps whenever possible.

Infection, postoperative shock, heart disease and postoperative hemorrhage all take a definite toll. Some conditions can be foreseen and prevented, while others, like uremia, cerebral hemorrhage and embolism, will continue to give rise to the so-called irreducible minimum of deaths following surgical procedures of this magnitude.

SUMMARY AND CONCLUSIONS

Carcinoma of the right colon is a favorable lesion for cure. It is technically easily removed; still, the mortality is higher than for resections for cancer elsewhere in the large bowel.

The lack of obstruction in cases of cancer of the right bowel so often eliminates the necessity of preliminary drainage that one is tempted to subject the patient to a one stage operation. Thus, the mortality is comparable to that for one stage resections elsewhere in the colon.

TABLE 3.—*Carcinoma of the Large Intestine, from 1925 to 1936: Cause of Death*

	One Stage Resection		Two Stage Resection	
	Cases	Segment	Cases	Segment
Peritonitis	24	3 Right 2 Transverse 8 Left 11 Rectum	9	1 Right 6 Left 2 Rectum
Pulmonary disease	22	9 Right 5 Left 8 Rectum	6	1 Right 1 Transverse 1 Left 3 Rectum
Intestinal obstruction	8	1 Right 1 Transverse 2 Left 4 Rectum	5	1 Transverse 1 Left 3 Rectum
Sepsis	5	1 Left 4 Rectum	5	1 Left 4 Rectum
Shock	3	2 Rectum 1 Right	2	1 Left 1 Rectum
Cardiac failure	3	3 Rectum	2	2 Rectum
Hemorrhage	1	1 Left	4	4 Rectum
Cerebral hemorrhage	3	2 Left 1 Rectum	0	
Renal condition	3	3 Rectum	0	
Embolism	2	1 Right 1 Rectum	0	
Miscellaneous	3	3 Rectum	0	
Total	77	15 Right 3 Transverse 19 Left 40 Rectum	33	2 Right 2 Transverse 10 Left 19 Rectum

A preliminary ileotransverse colostomy through a left abdominal incision is recommended, either a lateral or an end to side anastomosis, followed in from ten to fourteen days by a resection of the excluded bowel through a right abdominal incision.

The aseptic anastomosis of the Parker-Kerr type gives a lower mortality for all intestinal suture in the Massachusetts General Hospital than any of the other methods used.

ABSTRACT OF DISCUSSION

DR. FRED W. RANKIN, Lexington, Ky.: There are two general factors which influence not only mortality and morbidity but satisfactory end results: the ability of the patient to withstand a formidable operative procedure and technical considerations. Cancer of the right colon, as Dr. Allen pointed out, occurs in a favorable location, easily accessible, and, if the operating maneuver can be held to a reasonable mortality, gives a better end result than elsewhere in the gastro-intestinal tract, except in the low grade rectal cancer. One of the greatest advances in handling cancer in this location is the preliminary, preparatory period to which all these patients should be subjected. Obviously, surgical decompression is called for in cancer of the right colon with acute obstruction, and that decompression may be done either by ileostomy or by ileocolostomy as the first stage of the two stage maneuver.

Fortunately, obstruction is rarely a factor in cancer of the right colon, whereas in cancer on the left side it occurs in approximately three-fourths of the cases. After satisfactory decompression has been done in these cases, the routine operation should be what Dr. Allen says, an ileocolostomy between the terminal ileum and the transverse colon as the preliminary stage, and subsequently a resection; but occasionally a one stage procedure is desirable. The operation should be done end to side. The importance of doing a graded operation in the right colon is necessary because of the pericolonic infection and the frequently accompanying anemia, which is the result probably of some perverted function of the mucosa of the right colon but which leaves these people materially reduced surgical risks. If one does an end to side anastomosis, one removes all the fecal stream from passing over the carcinoma. The mortality in my groups has been approximately 10 per cent over a period of years. I cannot agree that all carcinoma of the right colon should be done in two stages. I do not think Dr. Allen means to imply that. Occasionally one finds an early case, a good risk without anemia, without obstruction, in which the operation can be carried out in one stage; but I think that invariably, if a one stage resection is done, a complementary ileostomy 20 or 25 cm. proximal to the anastomosis line should be one step of the operation. The end results following resection of the right colon are eminently satisfactory. I find 56 per cent of the patients alive after five years; 43 per cent are dead. It is inexplicable to me that cancer of the right colon should give a 10 per cent better ultimate prognosis than cancer of the left colon.

DR. HARVEY B. STONE, Baltimore: Dr. Allen was good enough to ask me to discuss his paper in view of the statistics of my own experience with cancer of the right side of the colon, predicting that the facts would show a less favorable outcome of the one stage resections than my offhand impression would lead me to believe. Most of the attempts to study problems like the present one by mathematical means are open to the objection that there is the great difficulty in selecting properly comparable groups of cases. Another approach to the problem seems to me to be better. I would say that both the one stage and two stage methods have their place. No one but an enthusiast without balance would do a one stage immediate resection and anastomosis in a patient in wretched general condition, with anemia, dehydration and acute obstruction. On the other hand, many patients are in such good condition, both generally and as concerns the local lesion, that to me it seems much safer to carry out a well conducted one stage operation than to subject the patient to the undoubted increased hazards of two anesthesias, two operations and two convalescent periods, to say nothing of the added expense, loss of time, pain, anxiety and apprehension. In short, the procedure should be adapted to the individual case, and no rules automatically applied. Dr. Allen has done a real service in emphasizing the limitations of the one stage principle and the utility of the two stage attack. I should like to supplement his position by expressing the view that the one stage procedure has marked advantages over the two stage, and that some countervailing condition in particular cases must exist to justify the rejection of these advantages. In the matter of the desirability of some form of so-called aseptic anastomotic technic, I heartily agree with Dr. Allen. While it is true that other principles are essential to success, I believe that the avoidance of an open exposure of the lumen of the intestine and the direct handling of the mucosa are of great importance in minimizing the chances of infection and add not only to the safety but to the neatness and finesse with which the technic may be carried out.

DR. ARTHUR W. ALLEN, Boston: All surgeons would prefer to do any large procedure in one stage if they could. I was a one stage enthusiast ten years ago. I must say that it has required a good many unsuccessful attempts at one stage operations on the large bowel to convert me to the two stage operation. I realize that statistics are of questionable value. On the other hand, I think one must bear in mind that these statistics during this decade were obtained during a time when operators were one stage minded, and most of the two stage operations in this group were done because the patient was a poor risk or was obstructed or depleted, and still, in spite of these facts, by the two stage method a much better showing has been made. As far as the mental attitude of the patient is concerned regarding second or third stage operations, any man who talks to the patient for five minutes before any operation can make him feel perfectly happy about the multiple stages necessary to get him through to a successful end result. I am grateful to Drs. Rankin and Stone for taking part in this discussion. I know that the question is debatable, but I still feel that perhaps operators have been too oblivious to the outcome of these patients, particularly with carcinomas of the right colon, and should more seriously consider them on a two stage basis.

HYPERTROPHY OF THE LIGAMENTA FLAVA AS A CAUSE OF LOW BACK PAIN

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Low back pain with or without radiation into one or both lower extremities has been studied with increasing interest in recent years. That many factors may be involved in the production of this group of symptoms is attested by a voluminous literature.[1] Many recent authors have considered ligamentous strain about the lumbosacral and sacro-iliac regions from faulty posture to be the chief etiologic factor.[2] Intraspinal pathologic changes have, however, received scant attention.

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2. Barr, J. S.: "Sciatica" Caused by Intervertebral-Disk Lesions: A Report of Forty Cases of Rupture of the Intervertebral Disk Occurring in the Low Lumbar Spine and Causing Pressure on the Cauda Equina, J. Bone & Joint Surg. **19**:323 (April) 1937. Schmorl and Junghann.[3] Williams.[9]

When this syndrome occurs in conjunction with objective neurologic changes, such as sensory or motor loss about the buttock, sexual impotence and possibly sphincteric disturbances, the lesion must be intraspinal, for bony disease peripheral to the neural canal simply cannot produce such a neurologic pattern. Any low intraspinal lesion, herniation of a nucleus pulposus, neoplasm or inflammatory disease may, of course, produce this clinical picture. Our purpose in this report is to discuss an intraspinal lesion which has not received general recognition; i. e., hypertrophy of the ligamentum flavum.

The ligamenta flava are composed normally of yellow elastic tissue and connect the laminae of contiguous vertebrae (fig. 1). They blend with the interspinous ligament and enter into the formation of the capsules of the joints between the articular facets, and their lateral edge forms the posterior margin of the intervertebral foramina. At times they may undergo hyperplastic change and become so increased in thickness that they encroach on the spinal canal, thereby compressing the spinal cord. This hyperplasia presumably is possible at any level, but our experience with the lesion is limited to the ligaments connecting the fourth and fifth lumbar vertebrae. Seven cases in which this lesion was the pathologic entity form the material for this report. In six of the seven cases the lamina of the fourth lumbar vertebra was, likewise, found to be greatly increased in thickness and appeared to be at least a part of the pathologic anatomy.

Hypertrophy of the ligamentum flavum with compression of the cauda equina was first described by Elsberg [3] in 1913. He reported a single case in which the hypertrophy followed direct injury to the fourth and fifth lumbar vertebrae. Since Elsberg's original description of the lesion there have been but six cases recorded: Towne and Reichert [4] two cases, Puusepp [5] three cases and Abbott [6] one case.

SYMPTOMATOLOGY

The duration of symptoms in this group of patients varied from three months to two years (table 1). In six instances there had been one or more recessions of symptoms. Each patient had been completely incapacitated for at least three months prior to operation.

Pain low in the back was the predominant complaint. In each instance there was elicited a history of trauma, which the patient felt was the causative factor. The most common story was: "While lifting a heavy object in a bended position I felt a sudden severe pain in the lower part of the back." Usually the acute attack of pain low in the back was followed by a period of relief after a few days or weeks, only to recur insidiously until the patient was incapacitated by the pain. In two cases, however, the onset of symptoms was gradual without history of an acute sudden attack. In none of our patients has the pain in the back been relieved by the recumbent position; most of them were more comfortable while sitting or standing. Sudden changing of position usually exaggerated the discomfort. Coughing, sneezing or straining at stool frequently augmented the pain.

Fig. 1. — Dissection to show the posterior wall of the spinal canal. Arrows indicate the position of the ligamenta flava.

Radiating pain into one or both lower extremities was present in all seven cases. In six it was unilateral (left) and in one it was bilateral. The pain usually followed the sciatic distribution except in two instances in which it was referred to the hip and testicle.

Sexual impotence was complete in three patients. Two patients were not within the age group in which sexual potency was a factor. The two remaining patients gave a negative history in this regard.

Subjective sensory loss in the lower lumbar and sacral segments was noted by five patients. This sensory change was described as "numbness" either in the legs or about the buttocks. Paresthesias were not described.

Urinary incontinence was present in but one patient of the group.

Subjective motor loss in the legs was described by four patients. In two instances the weakness was unilateral and in two it was bilateral.

Objectively, all patients had some degree of postural deformity. In the most extreme case the deformity was so great that an erect posture was impossible. In the others nothing more could be demonstrated than spinal rigidity with tilting of the pelvis. Tenderness to pressure over the spinous processes of the lower lumbar

TABLE 1.—*Subjective and Objective Observations in Seven Cases*

					Subjective								Objective		Cerebrospinal Fluid									
Case	Age	Sex	Race	History	Low Back Pain	Sciatic Pain	Sexual Impotence	Numbness	Sphincteric	Motor Loss	Tenderness of Spine	Sciatic Tenderness	Motor Weakness	Sensory Loss	Regional Tendon Reflexes	Trophic	Pressure	Queckenstedt	Total Protein	Cell Count	Gold Curve	Wassermann Reaction	Skeletal Roentgenograms	Iodized Oil	Operation	Result
1	36	♂	W	1 yr.	+	+L	+	+	+	+	+	+	+	+	Ab.	+	150	—	175	3	—	—	+	0	10/17/36	Complete recovery
2	29	♂	W	1 yr.	+	+L	—	+	—	—	+	+	—	+	Dim.	—	120	—	110	1	—	—	—	+	11/ 6/36	Complete recovery
3	27	♂	W	9 yrs.	+	+L	+	—	—	—	+	—	—	+	Nor.	—	160	—	75	1	—	—	—	+	11/23/36	Complete recovery
4	42	♂	W	1 yr.	+	+RL	—	+	—	+	+	—	+	+	Dim.	—	90	—	100	3	—	—	—	+	12/ 4/36	Complete recovery
5	59	♂	W	1 yr.	+	+L	0	+	—	+	+	+	+	+	Dim.	—	120	—	65	1	—	—	—	+	12/19/36	Died (meningitis)
6	38	♂	W	2 yrs.	+	+L	+	—	—	—	+	+	—	+	Dim.	—	120	—	100	1	—	—	—	+	1/15/37	Complete recovery
7	16	♂	W	3 mos.	+	+L	0	+	—	+	+	+	+	+	Dim.	—	150	—	45	1	—	—	—	+	3/29/37	Complete recovery

+ indicates positive; —, negative; 0, information not available.

3. Elsberg, C. A.: Experiences in Spinal Surgery, Surg., Gynec. & Obst. **16**: 117-132 (Feb.) 1913.
4. Towne, E. B., and Reichert, F. L.: Compression of the Lumbosacral Roots of the Spinal Cord by Thickened Ligamenta Flava, Ann. Surg. **94**: 327-336 (Sept.) 1931.
5. Puusepp, L.: Kompression der Cauda Equina durch das verdickte Ligamentum flavum: Tumorsymptome, Operation, Heilung, Folia neuropath. estoniana **12**: 38-48, 1932.
6. Abbott, W. D.: Compression of the Cauda Equina by the Ligamentum Flavum, J. A. M. A. **106**: 2129-2130 (June 20) 1936.

region was a constant finding. Mild tenderness to pressure over the sciatic nerve at the hip or in the thigh was present in five cases. Diminution of pain and temperature sensibility over the sacral skin segments was demonstrated in all seven cases. In four instances there was objective motor loss; in two patients this motor loss was accompanied by muscular atrophy. One

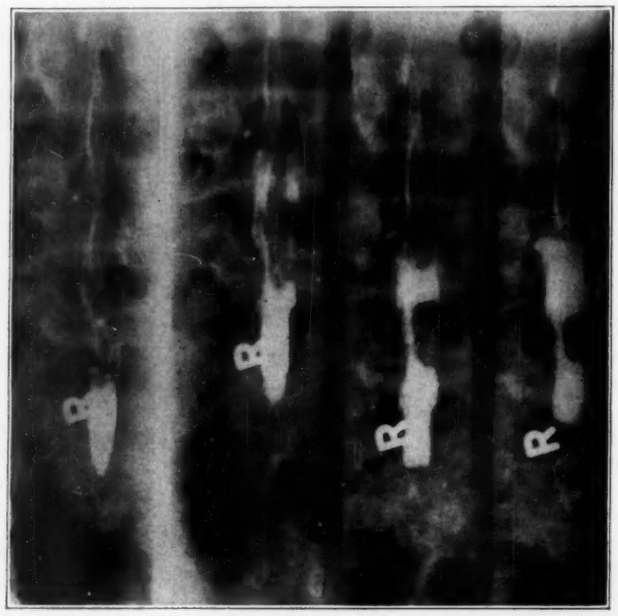

Fig. 2 (case 3, table 1).—Serial films showing filling defect between the fourth and fifth lumbar vertebrae after injection of 2 cc. of iodized poppy-seed oil into the spinal subarachnoid space.

patient had a trophic ulcer on the heel. The achilles tendon reflex was abolished or diminished in six of the seven cases.

We were unable to demonstrate by clinical or roentgenologic examination any of the manifestations usually observed in sacro-iliac disease.

DIAGNOSIS

A carefully performed neurologic examination is of primary importance in differentiating the "low back pain syndrome" of extraspinal origin from one of intraspinal disease. A knowledge of the arrangement of the sensory dermatomes, the regional reflexes and the muscular innervation of the buttocks and lower extremities is obviously essential. Most important of all is for the examiner to remember that disorders of the cauda equina may produce subjective symptoms identical to those of peripheral nerve disease.

When the neurologic examination is even suggestive of an intraspinal lesion, lumbar puncture studies should be made. If the puncture site is at the third lumbar interspace it is to be expected that no change in the hydrodynamics would be observed. If, however, the needle is inserted at or below the fourth interspace, a partial or complete obstruction may be demonstrated. In any event, the protein content of the fluid will probably be elevated, since an obstructive lesion is characteristically associated with an elevated total protein above and below the lesion. The remainder of the spinal fluid examination in our group yielded no useful information; the cell count was uniformly low; the gold curve and Wassermann reactions were negative (table 1).

Fluoroscopic examination of the spine after injection of 2 cc. of iodized poppy seed oil was the test that gave final, conclusive proof of the presence and location of the lesion. Our first case was examined without iodized oil studies because the neurologic manifestations were so advanced that accurate localization was unmistakable. In all the others we used the opaque medium, and in each instance the characteristic filling defect was shown opposite the fourth lumbar interspace (figs. 2 and 3).

Our technic of investigation with iodized poppy seed oil consists of fluoroscopy of the patient in a prone position on a tilting table. By the use of an ingenious casette holder and the quick switch described by Dr. J. C. Bell,[7] we are able to make instantaneous serial radiographic records of any filling defect observed on the fluoroscopic screen.

Plain x-ray films of the lower part of the spinal column have been negative for obvious bone or joint disorders. However, in every case the normal lumbar curve has been absent, the main axis of the lumbar spine being essentially perpendicular. This straight immobile lumbar spine is probably seen in other lesions associated with pain low in the back but certainly in this group it was a constant finding. In no case have we demonstrated narrowing of the intervertebral disks or spondylolisthesis. In view of the hypertrophy of the fourth lumbar lamina that we have seen at operation, it is surprising that we have been unable to show it radiographically.

TREATMENT

It must not be inferred that the following remarks on treatment are concerned in any way with the broad problems of low back pain; our discussion is directed only at the treatment of this particular lesion. We

Fig. 3 (case 2, table 1).—Serial films to show filling defect between the fourth and fifth lumbar vertebrae after injection of 2 cc. of iodized poppy-seed oil into the spinal subarachnoid space.

are heartily in accord with the efforts made by the orthopedists and internists at conservative treatment and believe that radical operative procedures should be reserved for those in whom simpler methods have failed.

The treatment of this lesion resolves itself into removal of the involved lamina and ligament. The

7. Bell, J. C.: Apparatus for the Study of Opaque Media in the Spinal Canal, Am. J. Roentgenol. **37**: 416-419 (March) 1937.

operation is performed under local infiltration with procaine hydrochloride. If the dura is opened for inspection of the cauda equina and anterior wall of the spinal canal, a low spinal anesthesia is added by instilling about the nerve roots from 20 to 30 mg. of procaine hydrochloride crystals for spinal anesthesia in Ringer's solution after blocking off the subarachnoid space at the upper level of the wound with a cotton pledget. We have regularly removed the lamina above and below the lesion for the purpose, chiefly, of adequate exposure. The lamina of the fourth lumbar vertebra has been completely sacrificed, including its superior articular facets. This wide exposure is necessary in order that the lateral portion of the thickened ligament may be removed. No attempt at spinal fusion has been made in any case. The patients are usually allowed out of bed on the twelfth day and are discharged from the hospital about the fifteenth day.

PROGNOSIS AND RESULTS

One fatality occurred in our series. Streptococcic meningitis secondary to wound infection was the cause of death. Barring the possibility of a rare catastrophe such as this, the operation should incur very little risk, since it is carried out under local anesthesia with a minimum amount of trauma and hemorrhage.

The other six patients have experienced prompt relief of symptoms. Pain, except that in or about the

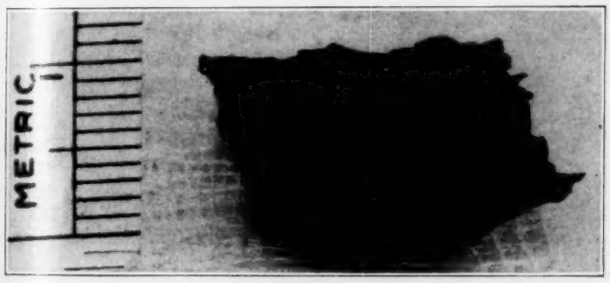

Fig. 4 (case 3, table 1).—Appearance of hypertrophied ligamentum flavum.

operative wound, has disappeared within twenty-four hours. The sensory loss was usually restored before the patient left the hospital. Those with loss of motor power showed normal muscular tone within a few weeks after operation. The three men who had complained of impotence stated voluntarily that they were again potent in from one to five days.

Patient 1, with incontinence of urine and a trophic ulcer on the heel, had regained sphincteric control by the twelfth day and the ulcer was rapidly diminishing in size. A follow-up letter four weeks after operation stated that the ulcer had healed completely.

Patient 3 still complained after eight weeks of weakness in the back and discomfort in the scrotum, but the sexual impotence was relieved and he had no pain in the back or legs. He was fitted with a brace for the lower part of the back and is now symptom free. Three patients returned to hard labor at the end of six weeks and have had no recurrence of symptoms after seven months, six months and five months respectively.

The earliest operation was done eight months ago and the last one three months ago, so the late results cannot be recorded.

PATHOLOGIC ANATOMY

The thickened lamina of the fourth lumbar vertebra was the first gross abnormality noted at operation. In comparison with the third and fifth laminae, it was from 50 to 100 per cent thicker than normal. The bone was spongy except for a thin hard cortex. Immediately beneath the lamina was found a mass of dense fibrous material totally different from the usual soft pliable ligamentum flavum (fig. 4). It usually covered the posterior aspect of the dura from side to side (figs. 5 and 6). In these masses numerous calcareous deposits were found, and in one case there was a solid

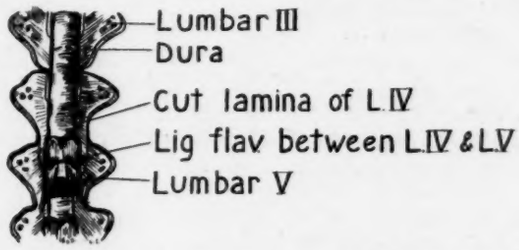

Fig. 5.—Drawing of a dissection showing ligamenta flava between the fourth and fifth lumbar vertebrae in place after laminae have been removed.

calcified plaque on the inner surface of the mass making a mold of the dura. It was impossible to secure accurate measurements of all the specimens, as some of them were removed piecemeal. Those which were excised intact measured from 10 mm. to 16 mm. in thickness. The thickened ligaments were always adherent to the dura and frequently when separation of them was attempted the dura was torn. In six of the seven cases the greatest hypertrophy was observed on the left side and corresponded to the leg in which the clinical symptoms predominated. The predural fat was always normal above and below the lesion and absent beneath it.

The articular facets were in each instance smooth and glistening and showed no gross evidence of abnormality.

Microscopic studies of the laminae gave a normal appearance. The ligaments showed interwoven bundles of white fibrous tissue and yellow elastic tissue, the former always predominating. There was no leukocytic infiltration, but the blood vessels in the surrounding tissue were thickened as from previous inflammation. In two of the specimens old blood pigment was found. All specimens showed many areas of calcification. The microscopic interpretation was difficult to make, since

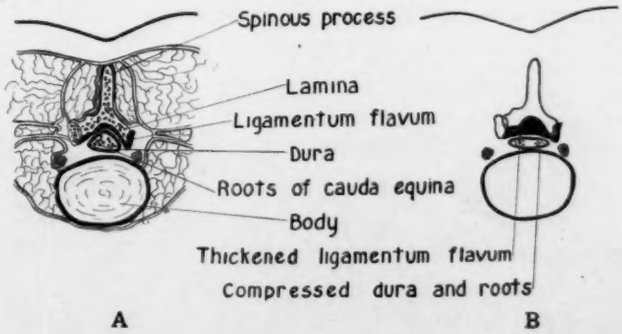

Fig. 6.—*A*, cross-section at level of the fourth lumbar vertebra showing the relationship of the lamina, ligamenta flava, cauda equina and vertebral body. *B*, diagram to illustrate compression of cauda equina by hypertrophied ligamenta flava.

it involved the explanation of scar tissue formation. As the usual signs of inflammation were not in evidence, it seemed most probable that trauma was the etiologic factor.

Since the hypertrophied bone did not show microscopic evidence of hyperplasia, the question arose as to whether the gross changes might not have been normal anatomic variations. Also it seemed desirable to know

the relative thickness of the ligamenta flava in the lumbar region. To answer these questions and to establish a satisfactory normal with which to compare the lesions, the following anatomic studies were made on cadaver specimens:

Measurements were taken through the lamina, half way between the articular process and the roof of the spinous process, of the third, fourth and fifth lumbar vertebrae (fig. 7). The material studied consisted of ninety-three vertebral columns; fifty-three of them were cleaned and dried and forty were in cadavers. A summary of these measurements is shown in table 2. From these studies it may be concluded that the lamina of the fourth lumbar vertebra is not appreciably thicker than that of the third or fifth lumbar vertebra in any given specimen.

The ligamenta flava at the third, fourth and fifth lumbar interspaces were measured in forty cadavers after the vertebral column had been cut longitudinally with a band saw along the plane indicated in figure 7. A summary of these measurements is shown in table 3. From these studies one may conclude that the ligamenta flava between the fourth and fifth lumbar interspace is not appreciably thicker than the other ligamenta flava of the lumbar region in any given specimen.

COMMENT

That the lesion which we have described has been responsible for the symptoms in this group of patients can best be attested to by the fact that they experienced prompt relief of symptoms. Furthermore, the signs of disease of the cauda equina have promptly disappeared after operation; paralyzed muscles have regained their power; normal sensation about the buttock and back of the legs has returned; sexual potency has been restored; a trophic ulcer has healed completely, and sphincteric control has been regained. These, plus disappearance of the subjective complaints, are to us ample proof that the causative lesion has been removed, yet we are unable to explain satisfactorily why it occurs. The history in most instances points to trauma; so does the microscopic pathologic study of the specimen. There have been no signs of infection grossly or microscopically. Certainly, neoplastic disease has been excluded. There has been no radiologic evidence of bony disease about the lumbosacral or sacro-iliac regions.

Fig. 7.—Diagram showing plane of measurements.

Direct trauma to the ligament and lamina, either acute or chronic, appears to us to be the most likely cause. This supposition is strengthened further by the fact that the lesion has always occurred at the lumbar spinal joint of greatest mobility. The ligamenta flava are placed on increased tension with the body in flexion. Also any shift of the pelvis which decreases the lumbar lordosis puts an increased strain on the ligaments. This postural deformity, therefore, would presumably cause continuous trauma to the ligamenta flava and lamina, and one would expect the greatest burden to fall on the joint of greatest mobility. The work of Schmorl [8] and Williams [9] indicates that torsion of the ligaments about the articular facets is responsible for the pain in cases of acute back strain. Since the ligamenta flava enter into the formation of the capsules of joints between the articular facets, it appears likely that they too may be injured by faulty alinement. The clinical history of our patients would indicate that the pressure on the cauda equina developed many weeks or months after the onset of backache. This finding fits well with the micropathologic study of the specimen, for all the ligaments have shown replacement of the normal yellow elastic tissue with white fibrous tissue in which there were calcareous deposits. These observations suggest that the ligamenta flava were probably traumatized in the beginning and in the process of healing or, as the result of continuous trauma, an excess of scar tissue was laid down. When this fibrous mass attained sufficient size to compress the nerve roots in the canal, the neurologic picture of intraspinal disease appeared. In other words, we believe that this lesion is of late occurrence and is probably the end result of inadequate treatment of the acute or subacute lesions, whatever they may be.

TABLE 2.—*Measurements of Laminae (Cadaver Specimens)* *

	Vertebra		
	Third Lumbar	Fourth Lumbar	Fifth Lumbar
Greatest thickness of lamina.....	10	12	11
Least thickness of lamina.....	5	4	3
Average thickness of lamina.....	7.2	7.3	6.5

*Number of specimens, ninety-three; measurements in millimeters.

TABLE 3.—*Measurements of Ligamenta Flava (Cadaver Specimens)* *

	Interspace		
	Third and Fourth Lumbar	Fourth and Fifth Lumbar	Fifth Lumbar and First Sacral
Greatest thickness	7	7	7
Least thickness	2	2	2
Average thickness	4.3	4.4	4.2

*Number of specimens, forty; measurements in millimeters.

SUMMARY

Hypertrophy of the ligamentum flavum in the lower lumbar region is associated with a group of clinical symptoms and signs which are remarkably constant. The chief characteristics of this syndrome are pain low in the back with neurologic signs of compression of the cauda equina.

321 West Broadway.

ABSTRACT OF DISCUSSION

DR. G. E. HAGGART, Boston: We have seen two patients at the Lahey Clinic who appear to fall in the group of cases described by Dr. Spurling and his co-authors. Both of these patients were operated on by Dr. Horrax and Dr. Poppen of the neurosurgical service. At the level of the third and fourth lumbar vertebrae they found thickened ligamenta flava without calcification. Exploration of the subdural space gave negative results. To determine the etiology of low back pain and sciatica is often difficult. The authors emphasized the point made by Towne and Reichert that the diagnosis of cauda equina compression can be made without difficulty after careful neurologic examination and lumbar puncture. Speaking from the orthopedic point of view I feel that all patients with sciatica should certainly have a lumbar puncture. The necessity for this particular examination in this group of patients was impressed on me by three patients who later proved to have large tumors of the cauda equina. In each instance the neurologic examination by a neurologist was negative. The recent work on herniated disks still further stresses the need for

8. Schmorl, Georg, and Junghann, Herbert: Die gesunde und kranke Wirbelsäule im Röntgenbild, Leipzig, Georg Thieme, 1932.
9. Williams, P. C.: Lesions of the Lumbosacral Spine: Part I. Acute Traumatic Destruction of the Lumbosacral Intervertebral Disk, J. Bone & Joint Surg. **19**: 343 (April) 1937.

lumbar puncture when sciatica is a symptom. If the studies should indicate caudal compression, then and only then should iodized oil be injected into the subdural space, followed of course by careful fluoroscopic examination. After the block is accurately localized, the treatment is laminectomy for removal of the obstruction, whether it is a herniated disk, tumor of the cauda equina, subarachnoid adhesions or, as in this group of cases, hypertrophy of the ligamenta flava. With regard to the reported hypertrophy of the fourth lumbar lamina, I am rather skeptical of the existence of this condition, because from experience with fusion operations on the lumbar spine I am impressed by the relatively larger appearing lamina of the fourth lumbar vertebrae when compared with the posterior elements of the adjacent vertebrae. It seems to me that this apparent hypertrophy might be an illusion resulting from the depth of the fourth lumbar vertebra as compared to the adjacent third and fifth lumbar and first sacral. I am further inclined to this belief because, as the authors state, in the roentgenograms of their patients there was no evidence of hypertrophy of the lamina of the fourth lumbar vertebra, while the microscopic studies of the laminae showed normal bone. In two instances microscopic examinations of the ligament revealed old blood. Might this not be due to previous lumbar puncture?

DR. CHARLES MURRAY GRATZ, New York: A large residue of patients suffering from pain low in the back remain undiagnosed after osseous disease and other etiologic factors have been excluded. The lack of a true diagnosis of this group prevents rational treatment. Dr. Spurling and his associates have added one more definite weapon which will further reduce the number of undiagnosed cases. They have supported their clinical observations by actual measurements of the tissues involved and have shown that changes in the soft tissues of the back interfere with nerve function. A study of the entire course of the nerves and particularly the tissues with which they come in contact in locomotion should shed even more light on this subject. Biomechanical studies have been published and are now being applied clinically with an encouraging reduction in the number of undiagnosed cases. The route of the nerves, blood vessels and lymphatics is through the fascial spaces. These spaces form true joints lined normally by a single layer of mesothelial cells corresponding to the synovial tissues found in the joints between bones. Fascial joints are supported by the fibers of the fasciae and correspond in function to the ligaments and tendons surrounding the joints between bones. The mesothelial covering of the fascial spaces facilitates movement of the nerves corresponding to the movements in the thoracic and peritoneal cavities. The normal functional mechanics of these tissues is disturbed by traumatic or inflammatory lesions. Anatomically these changes are shown by the presence of fascial adhesions. Clinically fascial adhesions are demonstrated by using air as a contrast medium and the irregular distribution of the air is shown radiographically by pneumofasciagrams. Clinical histopathologic observations confirming these changes are now available and are being reported in collaboration with Dr. L. H. Meeker. There is a hyperplasia of the mesothelial cells lining the fascial joints which may interfere with normal nerve function similarly to the hyperplasia of the ligamenta flava interfering with normal nerve function in the lower back. Rupture of the fibers of the fascia by disturbing the normal contour of the mesothelial cells is also a competent producing cause of disturbed nerve function. The time of repair in this group of cases would be delayed if the patient was suffering from a rheumatic condition. As a result of these observations we believe that fascial adhesions may be the true diagnosis of many cases which have been previously placed in the undiagnosed group. It is further believed that the temporary success of the irregular practitioner may be explained by breaking up these adhesions rather than by their claims of changing any of the anatomic positions of the osseous structures.

DR. FRANK R. OBER, Boston: I have a case that might be added to these. An aviator went into a 1,200 foot spiral fall and hurt his back. From that time on he had a chronic lame back with sciatica. The sciatica was down both legs. The roentgenograms showed definite disturbance of the lumbar spine with thinning of the disk between the third and fourth lumbar vertebrae. He had had many years of conservative treatment and he finally decided to have his spine fused. While the bones were being exposed for the fusion operation it was noted that the laminae were much more irregular than was apparent in the roentgenogram. Being convinced then that there was something more to the history than a chronic lame back, I determined on a laminectomy and directly under the fourth arch was a cord of tissue about one-fourth inch wide and one-eighth inch thick. This was pressing on the cauda equina. This bit of connective tissue was removed without injury to the dura. The man made a complete and uneventful recovery. He was relieved of his pain as soon as he came out of the anesthetic and has had no recurrence in four years.

DR. R. GLEN SPURLING, Louisville, Ky: I should not want to leave the impression that this operation is a panacea for low back pain and sciatic neuritis. As a matter of fact, we have studied a fairly large group of sufferers from chronic pain in the lower part of the back in order to find this many cases. I think probably it is a relatively uncommon lesion. With regard to Dr. Haggart's question about the old blood pigment found in the specimen, I will say that it might have been due to previous lumbar puncture—certainly not to a lumbar puncture in our own hands because the needle was never inserted into an involved interspace. Furthermore, the blood appeared to be from a very old hemorrhage and it was always associated with calcareous deposits in the ligament. I feel that iodized oil is a very valuable diagnostic adjunct and while not ideal it is the best available. I have used it in the spinal canal for ten years and I have seen no permanent untoward effects result from its use. However, I have never used more than 2 cc. and usually I employ 1 cc. Two cc. seems to me to be adequate for demonstrating lesions in the lower canal. I did see one patient injected elsewhere with 7 or 8 cc. who had such intractable pain that a chordotomy was necessary to relieve it.

CULTURE OF HUMAN MARROW

LENGTH OF LIFE OF THE NEUTROPHILS, EOSINOPHILS AND BASOPHILS OF NORMAL BLOOD AS DETERMINED BY COMPARATIVE CULTURES OF BLOOD AND STERNAL MARROW FROM HEALTHY PERSONS

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The development of a simple method of culture of human marrow,[1] by which actively motile mature neutrophils, eosinophils and basophils have been observed as late as fifty days after culture was started, suggested a new approach to the problem of the duration of life of the leukocytes of the blood.

That more data are needed on this question is indicated by the recent review of Garrey and Bryan,[2] in which they stated: "The idea that leukocytes are very short lived and that their intravascular life is limited to hours or three or four days (Weiskotten, 1930) is undergoing modification." They then cited the literature on the duration of life of leukocytes which, on analysis, shows a complete lack of agreement, various authors finding durations of from four to twenty-eight days. Examination of this literature reveals that most of the conclusions were based either

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From the Department of Medicine, University of Oregon Medical School.

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1. Osgood, E. E., and Muscovitz, A. N.: Culture of Human Marrow: Preliminary Report, J. A. M. A. **106**: 1888-1890 (May 30) 1936. Osgood, E. E., and Brownlee, Inez E.: Culture of Human Bone Marrow: A Simple Method for Multiple Cultures, J. A. M. A. **107**: 123 (July 11) 1936.

2. Garrey, W. E., and Bryan, W. R.: Variations in White Blood Cell Counts, Physiol. Rev. **15**:597-638 (Oct.) 1935.

on experiments on animals [3] or on indirect evidence. Margaret R. Lewis [4] cultured human blood on cover slips and reported that living human cells were seen as long as four weeks after culture was started but that these cells resembled clasmatocytes, epithelioid cells or giant cells, were phagocytic and appeared to develop from the monocytes; she said nothing about the duration of life of the mature neutrophils, eosinophils or basophils.

METHOD

Details of the method of culture have been described.[5] Briefly, the cultures are made in 30 cc. vaccine vials in a medium consisting of about 35 per cent of human cord serum and 65 per cent of the balanced salt solution of the Geys.[6] This medium was previously determined

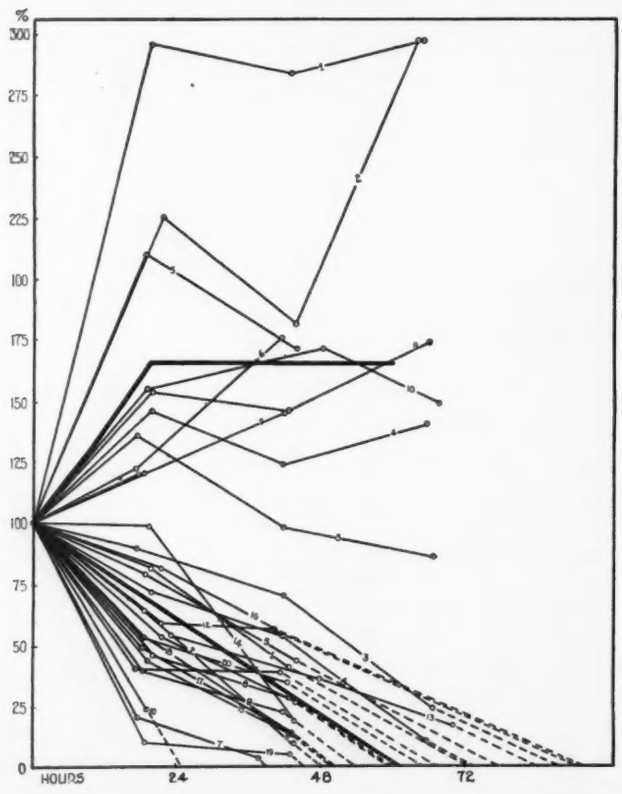

Fig. 1.—Course of the total neutrophil lobocyte (polymorphonuclear) count in marrow and blood cultures. The ten numbered curves above the 100 per cent line represent the course of the total neutrophil lobocyte count expressed in percentage of the initial count in ten marrow cultures from healthy medical students. The heavy black line is the smoothed average of these curves. The twenty numbered curves below the 100 per cent line represent the curves of the neutrophil lobocyte count in twenty cultures of blood from healthy persons. The curves numbered from 1 to 10 are from the bloods of cultures made from five to ten minutes before the marrow cultures. The blood and the marrow culture from the same person have the same number. The broken lines are explained in the text and represent at the point that cuts the base line the probable time at which neutrophil lobocytes disappeared from the culture. The heavy black line is the smoothed average of the twenty blood cultures.

by the Geys to be satisfactory for the culture of human tumors, and we have found it to maintain cultures of human marrow in as nearly their natural state as any medium so far investigated. It will be noted that the medium contains no substance not present in normal blood.

Cultures of bloods of twenty healthy medical students were made according to the technic for marrow, and cultures of the sternal marrow, taken from five to ten minutes after the blood, of ten of the same students were made. These cultures were adjusted to contain approximately the same number of total nucleated cells and were handled as nearly identically as possible. The average initial total number of white cells in the twenty blood cultures was 15 million, and the average initial total number of nucleated cells in the ten marrow cultures was 16.5 million. The initital count was computed from the average of two closely agreeing counts, made according to the author's technic for leukocyte counting,[7] which gives the number of cells per cubic millimeter and, when this is multiplied by the volume of culture, which averaged 12 cc., or 12,000 cubic millimeters, gives the total number of nucleated cells in the cultures. From Wright's stained smears of these cultures, differential cell counts were made, 200 cells being counted in the blood smears and 500 cells in the marrow smears, and the cells were classified according to the nomenclature [8] in the table and criteria described in detail elsewhere.[9] Multiplying the percentage of neutrophil lobocytes (polymorphonuclears) by the total count gave the initial number of these cells present in each culture. The average number was 6.4 million in the blood cultures and 3.8 million in the marrow cultures. The smaller number in the marrow cultures was due to the normally lower percentage of neutrophil lobocytes in marrow. The initial count of neutrophil lobocytes was taken as 100 per cent for both the marrow and the blood cultures. These counts, together with subsequent counts determined in a similar manner and calculated in terms of percentage of the initial count, are recorded in figure 1.

Nomenclature of Granulocyte (Myeloid) Series as Used in This Article *

Name Here Used	Names Which Have Been Applied to the Same Cell
Granuloblast	Myeloblast, hemocytoblast, lymphoidocyte, lymphocyte, stem cell
Progranulocyte S†	Promyelocyte I, myelocyte A, myelocyte, nonfilament, class I
Progranulocyte A	Promyelocyte II, leukoblast, basophil myelocyte, myeloblast, premyelocyte
Granulocyte	Myelocyte, myelocyte B, nonfilament, class I
Metagranulocyte	Metamyelocyte, juvenile, myelocyte C, nonfilament, class I
Rhabdocyte	Staff cell, stab cell, band cell, nonfilament, class I, rod nuclear, polymorphonuclear
Lobocyte	Segmented neutrophil, polymorphonuclear, filamented, class II, III, IV or V

* Modified from table 2 in the Osgood and Ashworth "Atlas of Hematology," reference 9.

† Any basophil from the progranulocyte to the lobocyte is sometimes called a mast cell.

COMMENT

In figure 1 all the ten marrow cultures show an increase in neutrophil lobocytes (polymorphonuclears) at twenty-four hours to a level of from 120 to 300 per

3. Weiskotten, H. G.: The Normal Life Span of the Neutrophile (Amphophile) Leukocyte (Rabbit): The Action of Benzol IX, Am. J. Path. **6**: 183-190 (March) 1930.

4. Lewis, Margaret R.: The Formation of Macrophages, Epithelioid Cells and Giant Cells from Leukocytes in Incubated Blood, Am. J. Path. **1**: 91-100 (Jan.) 1925.

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6. Gey, G. O., and Gey, Margaret K.: The Maintenance of Human Normal Cells and Tumor Cells in Continuous Culture: I. Preliminary Report: Cultivation of Mesoblastic Tumors and Normal Tissue and Notes on Methods of Cultivation, Am. J. Cancer **27**: 45-76 (May) 1936.

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8. The reasons for the choice of the terms used and for the coining of new terms for some cells of the erythrocyte and granulocyte series are given in Osgood, E. E., and Ashworth, Clarice M.: Atlas of Hematology, San Francisco, J. W. Stacey, Inc., 1937.

9. Osgood, E. E., and Ashworth, Clarice M.: Atlas of Hematology, San Francisco, J. W. Stacey, Inc., 1937. Osgood, E. E.: The Histogenesis, Classification and Identification of the Cells of the Blood and Marrow, Based on Cultures and Hematologic Studies of Human Marrow and Blood, Am. J. Clin. Path., to be published.

cent of the initial count. The average increase indicated by the heavy black line is to 166 per cent. There is then a tendency for the counts to level off, as shown by the straight line of the smoothed average. Neutrophil lobocytes were present in the marrow cultures for as long as the cultures were kept, which, in some instances, was twenty-seven days. They were actively motile in supravital preparations and retained their ability to phagocytize bacteria either living or introduced as vaccines (fig. 2). It seems justifiable, therefore, to conclude that the medium contained the ingredients essential for multiplication, growth, maturation and the preservation of normal morphology and functional activity of cells of the granulocyte series. It seems justifiable to conclude further that the technic of handling did not seriously damage the cells. The presence of many mitoses in the progranulocytes (promyclocytes) (figs. 3 and 4) indicates that the probable reason for the continuous presence of mature cells is maturation from multiplying progranulocytes. The absence of any mitoses in the more mature cells of this series, not only in these marrow cultures but in hundreds of others, justifies the conclusion that probably neither mitotic nor amitotic division occurs in cells more mature than the progranulocyte.

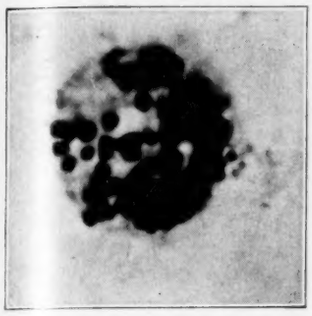

Fig. 2.—Neutrophil lobocyte (× 2,100) in Wright's stained smear made from a twenty day old marrow culture (from marrow 4) fifteen minutes after the addition of staphylococcus vaccine.

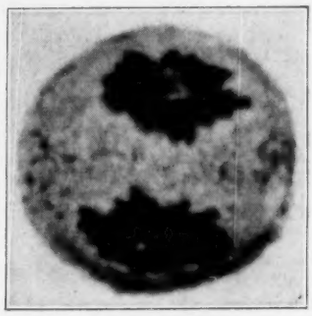

Fig. 3.—Progranulocyte in the anaphase of mitosis (× 2,100) in Wright's stained smear made from an eighteen day old culture of marrow 1.

Since normal blood contains only lobocytes (polymorphonuclears) and a very few rhabdocytes (staff cells) and these cells have never been observed to divide, it seems justifiable to conclude that multiplication of these cells does not occur in cultures of blood. Since maturation obviously occurred in the marrow cultures, it seems probable that further maturation and death of lobocytes will occur in blood cultures which are handled in the same way as the corresponding marrow culture. The results of the blood cultures are also summarized in figure 1. Note that all twenty showed a rapid drop in the number of neutrophil lobocytes and that this drop tends to fit an approximately straight line curve within the limits of error of the experimental method. The date when no appreciable numbers of neutrophil lobocytes were seen in the smears could not be used as the time of disappearance because, obviously, one did not know how many hours before the time of the count the cells had disappeared from the blood culture. Consequently, the most probable time of disappearance of neutrophil lobocytes was determined by projecting a line from the 100 per cent mark through the last count in which neutrophil lobocytes were present in significant numbers to the base line. It will be noted that all these lines strike the base line at between twenty-five and eight-nine hours and that all but three strike it at between forty-eight and eighty-nine hours. A smoothed curve plotted from the average of the twenty curves for the blood cultures forms a straight line and strikes the base line at sixty-one hours, which is also the average of the duration of life as computed from the point at which the projected lines strike the base line. The straight line curve is that expected if there were an equal number of cells of each age present at the time the blood was taken. It seems justifiable therefore to conclude that in such blood cultures neutrophil lobocytes live only from about forty-eight to eighty-nine hours (average, sixty-one).

An occasional neutrophil lobocyte could be observed by prolonged search in these blood cultures at from four to seven days, but in no cultures were there enough after three days to be included in the ordinary differential count of 200 cells. It seems probable that these neutrophil lobocytes represented the cells which were initially rhabdocytes. This suggests that the duration of life of the rhabdocyte from the time it gets into the blood until it becomes a lobocyte is about three or four days. More accurate calculations of the duration of life of the neutrophil rhabdocyte and other immature cells of the granulocyte series, based on the percentages in marrow cultures in a state of equilibrium, will be presented in another communication.

At the same time that the data were gathered on the duration of life of the neutrophil lobocytes, the duration of life of the eosinophils and basophils was studied. The data on these cells are not susceptible of graphic presentation because the normal percentages of the cells are too low for any feasible differential count to have great statistical significance. However, the slides were searched daily with an 8 mm. objective, thousands of cells being looked over, and the last day on which any eosinophils or basophils were seen in the cultures was recorded. The results of these studies showed at once that eosinophils and basophils live longer than neutrophils. In three of the blood cultures eosinophils were last found on the twelfth day; in seven, on the tenth day, and in seven, on the eighth or ninth day. It seems justifiable therefore to conclude that the duration of life of the eosinophils in cultures of normal blood, made according to this technic, is from about eight to twelve days.

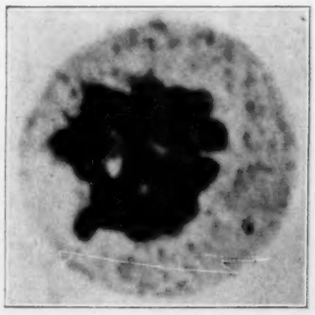

Fig. 4.—Progranulocyte in mitosis (×2,100) from a twenty-seven day old culture of marrow 1.

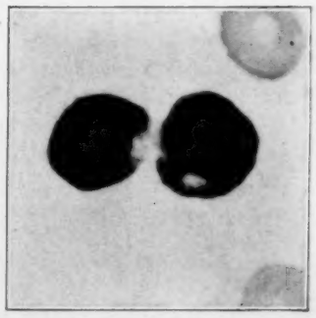

Fig. 5.—Lymphocytes (× 2,100) just completing amitotic division from culture of blood 19.

The basophils survived even longer, well preserved basophils being found on the eighteenth day in one blood culture, on the fifteenth day in two and on the

twelfth day in four blood cultures. Considering the small numbers of basophils found in normal blood, it seems justifiable to conclude that the duration of life of these cells in such cultures is from about twelve to fifteen days.

It was shown by supravital preparations and by the addition of vaccines to cultures, smears being made from fifteen to twenty minutes later, that cells which retained good morphology in Wright's stained preparations were living cells and that dead cells disintegrated and disappeared within a few hours after they lost their motility and phagocytic ability.

A number of other observations were made on the blood cultures. The lymphocytes multiplied by amitotic division as long as the cultures were kept (fig. 5). The occasional promonocytes present multiplied rapidly by mitotic division and increased greatly in size to resemble the tissue histiocytes, sometimes called clasmatocytes, thus confirming the observations of Lewis.[4] Plasmablasts, proplasmacytes and plasmacytes were present in the blood initially and multiplied by both mitotic and amitotic division. No intermediate stages between any of these cells and cells of the granulocyte series were observed, nor any evidence that lymphocytes gave rise to any other cell except another lymphocyte. There was a tendency of the number of lobes in the lobocytes to increase, but some lobocytes with only two lobes were observed on the last days that any neutrophils could be seen.

A detailed presentation of these observations will appear in subsequent articles.

It is evident that conditions in such cultures are not identical with conditions in the blood stream, so that it is not justifiable to transfer the results directly. It may be objected that centrifugation may destroy cells, that the medium used is not the patient's own serum and that the cells in the cultures are not exposed to phagocytosis by the cells of the reticulo-endothelial system or to opportunities of migration out of the vascular bed. This is all true, but it must be remembered that marrow cultures live longer in this medium than they do in serum from the subject from whom the marrow is taken, that the cells are not subjected to the trauma of circulation, which must be at least equal to that of the occasional centrifugation, and that they are exposed to phagocytosis by monocytes, promonocytes and macrophages developing from these cells, which are similar to, if not identical with, the phagocytic cells of the reticulo-endothelial system. Therefore, while no claim is made that the figures recorded represent the actual duration of life of these cells in the blood, it does seem that the method offers the most direct approach to the problem so far available.

CONCLUSIONS

In cultures of human blood, by a technic which, with marrow, permits multiplication, maturation and functional activity of cells of the granulocyte series for at least six weeks, the duration of life of the neutrophils averaged sixty-one hours and, in the majority of instances, was between forty-eight and ninety hours. It seems probable that these figures represent about the actual duration of life of these cells in the blood. The duration of the life of eosinophils, from eight to twelve days, and basophils, from twelve to fifteen days, determined by this method, is much longer than the duration of life of the neutrophils.

ABSTRACT OF DISCUSSION

DR. ROY R. KRACKE, Emory University, Ga.: Dr. Osgood has provided a method whereby sterile blood can be introduced into a receptacle containing a medium that apparently is suitable for the growth of immature cells, since the medium contains practically the ingredients of blood plasma which has been fortified by the addition of cord blood. He also provides optimal temperature conditions and, what seems to me to be more important, the apparatus is so constructed that it provides optimal conditions of gas exchange; that is, there is a proper degree of oxygen tension in the culture medium. He has devised equipment that is capable of simulating conditions as they may exist in the bone marrow, including even the removal of waste products. An important consideration in a new method of this type is the establishment of normal values. Dr. Osgood has been doing this for some time. Therefore his figures for the normal must be accepted when the applicability of this method for studies of the abnormal is being considered. Dr. Osgood was kind enough to send me a culture of human marrow a few weeks ago which I have studied in considerable detail, after it had been transported from Oregon to Georgia over a period of four or five days. I found that the number of cells present as determined by ordinary counting methods was greater than when it left his laboratory; mitotic figures were present in considerable numbers; the granulocytic cells were alive so far as could be determined, based on the criterion of motility and the capacity to take up vital stains. Apparently the criteria of cell growth and division are, first, an increase in cell numbers in the cultures, and, second, the presence of increasing numbers of mitotic figures. I noticed many cells in amitotic division, which condition has been said to be a sign of degeneration rather than active multiplication and reproduction. I have been concerned as to what may be done with such a method. In his exhibit, Dr. Osgood has outlined a large number of problems that may be studied by the use of this method. An important type of research would include the testing of various agents for the suppression or the acceleration of the maturation of the granulocytic cells. The question arises as to whether or not the results obtained can be applied to activity of the human marrow. This question, of course, cannot be answered. I can subscribe to the view that this does represent probably one of the best methods for the determination of the length of life of these various cells. Weiskotten and his associates have done this before and found that the average length of life of the neutrophil was about four days as measured by the injection of benzene into rabbits. The method of Dr. Osgood requires many years for development and many years for evaluation as to its actual value.

DR. MAX B. LURIE, Philadelphia: I should like to ask Dr. Osgood whether this method is suitable for the growth in tissue culture of other cells than those derived from the bone marrow. Carrel has shown in the bone marrow substances which he named trephones, which have a particularly stimulating effect on the growth of cells. Is it possible that the reason leukocytes die is not that their life cycle is shorter or longer but that the blood is not a suitable medium for the multiplication of leukocytes, whereas substances derived from the bone marrow support the multiplication of these cells?

DR. W. E. GARREY, Nashville, Tenn.: It is gratifying to find a direct approach to a problem such as that presented by Dr. Osgood. One will appreciate the difficulties in evaluating the life span of the leukocyte if one has occasion, as I have had recently, to review the literature in this field. In a search to determine the causes of variations in leukocytes one finds repeated reference to the rapid death of leukocytes, which are assumed to survive only for an hour or even for minutes in the blood, while other authors state that leukocytes, neutrophils, may live as much as two months. Dr. Osgood's direct determination of the duration of life of a leukocyte is needed, for it is an extremely important matter to make this decision if one is going to understand anything about the physiologic variations in the number of leukocytes under different conditions.

DR. EDWIN E. OSGOOD, Portland, Ore.: In reply to the question of Dr. Lurie regarding the presence of trephones in the marrow, in our cultures the cells are washed free from all

material from the marrow before introducing them into the medium. We also wash the blood cells free from their own serum and introduce them into medium of the some composition as that used for the marrow cells. Therefore, if any trephones are carried in from the marrow, they must be intracellular rather than extracellular.

Clinical Notes, Suggestions and New Instruments

BACILLUS PROTEUS PYELONEPHRITIS WITH THROMBOPHLEBITIS OF THE INTRINSIC RENAL VEINS AND SEPTICEMIA

EDWIN F. HIRSCH, M.D., AND DOROTHY A. SHAPIRO, B.S., CHICAGO

Comprehensive summaries of focal and systemic diseases in man caused by proteus organisms have been published by Meyerhof [1] and Bengston.[2] Since then, other reports of specific tissue infections by proteus organisms, occasionally with septicemia, have appeared.[3] According to these sources of information, bacteria of the proteus group have recognized importance in infections of the urinary tract, the acute enteritides of children and adults, meat poisoning, Weil's disease, other icteric diseases, chronic otitis media, peridental abscess, meningitis, empyema of the chest, periurethral infection, and perinephric and peritonsillar abscesses. Septicemia secondary to infections of the kidney usually is caused by colon organisms; less frequently by streptococci or staphylococci. Although infections of the urinary tract are due to bacteria of the proteus group, a proteus septicemia secondary to pyelonephritis, in fact, from any primary focus, is unusual. Lenhartz [4] emphasized this in his report of proteus pyonephritis, accompanied by clinical symptoms of sepsis. Excision of the markedly diseased left kidney relieved the systemic manifestations of this patient. Proteus pyelitis is serious, according to Lenhartz, because the ammoniacal substances produced by the decomposition of the urine severely injure the renal parenchyma, especially with retention. The prognosis with proteus infections of the urinary tract, therefore, is much less favorable than with other bacterial invaders. Kretschmer and Mason [5] also commented on the few published reports of proteus septicemia. They observed two patients with proteus septicemia secondary to renal infections. Both had renal concretions, one had renal tuberculosis, and each recovered following surgical treatment. Among the 305 infections of the urinary tract mentioned in this report, a single organism was recovered in 224; eight of these were proteus. The other eighty-one infections were mixed; proteus organisms were present in twelve.

The pathways of invasion in an ascending infection of the kidney have been reviewed and discussed by Helmholz.[6] He observed in animal experiments that ascending infections of the kidney were associated frequently with mural thrombosis of the renal veins and emphasized vascular and perivascular spread of the infection rather than ascent of the tubules. An illustration of venous thrombosis in acute pyelitis of infancy correlated his animal experiments with human infections. Although the pathologic processes in the spread of pyonephritis into a septicemic disease are not discussed in textbooks on urology or in individual reports, the basic principles are doubtless those of other septic disorders; namely, bacterial phlebitis or thrombophlebitis of blood or lymph channels. Bacterial phlebitis or thrombophlebitis of the intrinsic branches of the renal veins as noted by Helmholz provides the pathologic tissue medium whereby septicemia develops from ascending pyonephritis.

From the Henry Baird Favill Laboratory of St. Luke's Hospital.

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REPORT OF CASE

A white man, aged 45, in whom septicemia secondary to thrombophlebitis of the intrinsic renal veins caused by a proteus organism had developed, was admitted to St. Luke's Hospital, Nov. 12, 1936, in the care of Dr. K. H. Tannenbaum. He had been ill with fever and chills for one week. The patient had a constant pain in the region of the left kidney and hematuria on the first day of illness. Urgency, frequency and dysuria were marked. Three days before admission he had passed a urinary concretion. Dr. Tannenbaum had treated his patient for chronic prostatitis, seminal vesiculitis and urethral polyps. When admitted to the hospital, he had a high fever, rapid pulse and symptoms of sepsis. The alkaline urine contained erythrocytes, leukocytes, bacteria and a large amount of albumin. The leukocytes of the blood were 26,350 per cubic millimeter. An intravenous pyelogram disclosed large kidneys without concretion deformities or perinephric abscess. Dr. L. E. Schmidt in consultation made a diagnosis of left pyelonephritis and advised nephrectomy or drainage. The patient died November 16, a few hours after the nephrectomy, four days after admission to the hospital and eleven days after the acute onset of his illness. Cultures of the urine had yielded a heavy growth of proteus organisms, and those of the blood on November 13 and November 15 contained more of these bacteria.

Section of a mural thrombus in one of the large intrinsic branches of the renal vein. Reduced from a photomicrograph with a magnification of 198 diameters.

The excised left kidney weighed 280 Gm. and was 14 cm. long, 7 cm. wide and 5.5 cm. thick. Petechial and larger hemorrhages mottled the gray, smooth, subcapsular surface. There were no obvious focal abscesses. On the surfaces made by hemisecting the kidney frontally, the edematous tan-gray cortex was 7 mm. wide and the pyramid tissues 15 mm. The cortical markings were distinct; there were no abscesses. The dark red pyramid tissues with their radial markings contrasted sharply with the gray cortex. Several small granular calcium carbonate and calcium and magnesium phosphate concretions

were in one of the lower calices. The amputation of the blood vessels and ureter was at the level of the renal pelvis.

Histologic examinations demonstrated marked acute parenchymatous changes of the tubular epithelium and dense leukocytic exudates in the lumens of some tubules. There were multiple small abscesses in the subpelvic tissues. Branches of the renal vein in the kidney tissues had mural thrombi composed of dense masses of erythrocytes, polymorphonuclear leukocytes, monocytes and fibrin. The structure of one of these is shown in the accompanying illustration. Clumps of bacilli were found among the exudate cells in sections stained with methylene blue. The anatomic diagnosis was acute ascending pyonephritis and thrombophlebitis of the intrarenal veins.

The postmortem examination of the trunk and lower portion of the neck demonstrated changes of the viscera that occur with septicemia. The body weighed 91 Kg. The tissues traumatized during the recent surgical nephrectomy were hemorrhagic. A concretion 6 mm. in diameter obstructed the left ureter at the urinary bladder. The lumen above was dilated to a circumference of 2 cm. The lining was gray and hyperemic. The right kidney, weighing 250 Gm., showed acute parenchymatous changes. Several granular concretions, from 1 to 5 mm. in diameter, were in the lower calices. The spleen weighed 510 Gm.; the pulp tissues were soft, friable and hyperemic. The liver weighed 2,475 Gm. and the tissues had a marked cloudy swelling. Colonies of proteus organisms were isolated in pure culture from fluids in the left ureter, from the liver and from the spleen.

The routine histologic examinations of the viscera of the patient obtained post mortem demonstrated in the right kidney marked parenchymatous changes, a few small foci of chronic inflammation but no acute inflammatory exudates of an infection. The liver showed focal fatty changes and small infiltrations of polymorphonuclear leukocytes of the periportal tissues. There were no abscesses. The pulp tissues of the spleen were hyperemic. They contained multiple hemorrhages, focal infiltrations of polymorphonuclear leukocytes and a hyperplasia of the reticulo-endothelial cells. Many acini of the prostate contained dense collections of polymorphonuclear leukocytes. The papillary tissues of the neck of the urinary bladder had blunt vascular fibrous stalks covered by thin layers of stratified squamous epithelium.

The strains of slender motile gram-negative bacilli isolated from the spleen, liver and left ureter after death and from the blood and urine during life formed spreading, flat, gray, nonhemolytic colonies on blood agar. They grew abundantly without producing pigment on plain agar and Endo's mediums. Serum of the patient obtained during the postmortem examination agglutinated organisms from all sources in dilutions as high as 1:2,400 and those from the blood cultures and spleen in dilutions of 1:4,800 and 1:7,200 respectively. The patient's serum was tested for agglutinins with three proteus strains obtained through Dr. G. M. Dack from the department of bacteriology of the University of Chicago and designated P_{14}, P_{15} and X_{19}. Another stock culture was designated 14V. The organisms of P_{15} were not agglutinated by the patient's serum, those of X_{19} were agglutinated in dilutions of 1:160, and those of P_{14} and 14V in dilutions of 1:320. The patient's serum had no effect on a strain of Bacillus coli, and human serum from other sources did not agglutinate the proteus strains recovered from the patient. The cultural reactions of the organisms from various sources of the patient were alike. The Voges-Proskauer reaction was positive and nitrates were reduced to nitrites. Acid and gas were produced in dextrose mediums; acid in sucrose, levulose and galactose. Lactose, salicin, mannite, maltose and dextrin were not fermented; indole was produced, lead acetate was blackened, milk was peptonized and gelatin was liquefied. Broth cultures inoculated intraperitoneally did not kill white rats. Similar cultures inoculated intracutaneously and subcutaneously in rabbits produced indolent abscesses. Intravenous injections of broth cultures did not kill rabbits. A rabbit so injected became markedly emaciated and, when killed after two weeks, its liver, spleen, kidneys, lungs and heart's blood were sterile.

COMMENT

The fatal proteus septicemia of this patient has been traced to a thrombophlebitis of the intrinsic divisions of the renal vein, a complication of an ascending pyelonephritis. The ureteral concretion impacted at the orifice into the urinary bladder doubtless contributed to the ascending spread of the infection from the bladder. Thrombophlebitis of the intrinsic branches of the renal veins is important not alone in the spread of an infection into the kidney with ascending infections, as Helmholz has suggested, but also for the hematogenous spread of bacteria into a septicemic disease. The isolation of bacteria with the specific cultural characteristics of proteus organisms from the blood and urine of this patient before death and from the spleen, liver and left ureter after death is substantial evidence favoring the causal relationship of the bacteria to the disease. The high agglutinin titer of the patient's serum obtained post mortem for these strains (from 1:2,400 to 1:7,200) and for several stock strains of proteus organisms (from 1:160 to 1:320) is convincing support for this relation. According to van der Hoeden [7] the presence of agglutinins in the serum of patients with proteus infections favors the view that the bacteria are pathogenic. Garry [8] stated that the agglutination of proteus organisms by high dilutions of the patient's serum is specific but in low dilutions has only relative value.

1439 South Michigan Avenue.

BLEEDING PEPTIC ULCER IN MECKEL'S DIVERTICULUM

JAMES E. THOMPSON, M.D., NEW YORK

History.—A girl, aged 8 years, was brought to the Roosevelt Hospital Jan. 14, 1936, with the history that she had been passing blood by the rectum for twenty-four hours.

Three years before she had passed a copious amount of blood in a bowel movement and was taken immediately to a Brooklyn hospital, where she was kept under observation for five weeks. The mother was told at the time that the child was an easy bleeder. Since this one episode the child had been completely free from symptoms until the onset of her present illness.

Fig. 1.—The diverticulum as seen at operation.

She had never bruised easily, nor had she ever shown petechiae or purpuric spots. There was no history of nausea, vomiting or abdominal cramps.

Twenty-four hours before admission, and without any warning signs, she passed several large dark clots of blood and much black watery material in a bowel movement. The mother recognized it as a recurrence of bleeding but waited until morning to see what would happen.

Results of Examinations of the Blood

Blood: 1/15/36, R.B.C. 3,640,000; Hgb. 60%; W.B.C. 4,640;
Polymorphonuclears 64%; lymphocytes 30;
mononuclears 6%
Bleeding time 2 minutes
Clotting time 20 minutes
R.B.C., W.B.C., and platelets seem normal
1/16/36, R.B.C. 2,830,000; Hgb. 58%
1/17/36, R.B.C. 3,570,000; Hgb. 61%; clotting time 10 minutes
1/18/36, R.B.C. 3,010,000; Hgb. 58%
1/25/36, R.B.C. 3,700,000; Hgb. 66%; bleeding time 4½ minutes;
clotting time 6 minutes
2/15/36, R.B.C. 4,450,000; Hgb. 78%
2/21/36, R.B.C. 5,210,000; Hgb. 84%

The child was allowed to attend school the next morning and returned at noon and passed a few more clots. She went back to school in the afternoon, but that evening she passed such a

7. van der Hoeden, J.: Abstr. Centralbl. f. Bakt. **111**: 408, 1933.
8. Garry, Gerschon: Med. Klin. **28**: 1205 (Aug. 26) 1932.

great quantity of clotted blood and black fluid stool that an ambulance was called. The child became faint and complained of not being able to see clearly.

Shortly after admission to the hospital she was given a bed pan and passed clotted blood, which assumed an appearance identical to that of a freshly passed placenta, with its central dark mass and liquid bright red blood about the periphery.

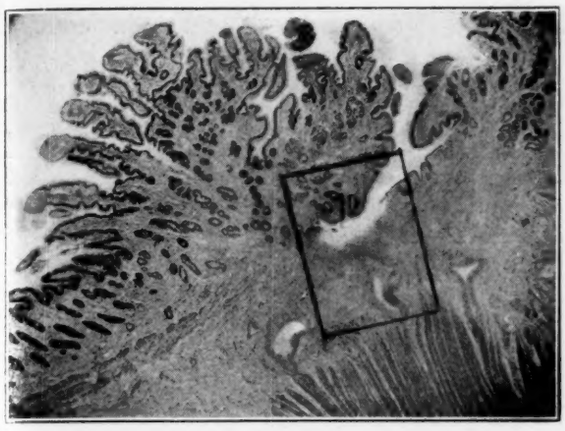

Fig. 2.—Ulcer in gastric type of mucosa (×15). Marked zone shows field of figure 3.

The father and mother, aged 32 and 27, and three siblings were living and well. The mother had had two abortions. There was no familial history of bleeders.

Examination.—Physical examination was in general negative except for the condition chiefly concerned. The tourniquet test was positive after five minutes. The temperature was normal, the pulse 108, and the respiration rate 20.

Fig. 3.—Ulcer with hyaline fibrous base and eroded artery in which organization is well advanced (×60).

Results of examinations of the blood are given in the accompanying table.

The stools were grossly bloody for two days. The urine was normal throughout, except for an occasional faint trace of albumin.

The diagnosis of a bleeding peptic ulcer in Meckel's diverticulum was made the day following admission. It was decided to defer operation, however, until her general condition improved, unless there continued to be gross evidence of active bleeding.

The guaiac test for blood was intermittently positive for two weeks, after which time it was consistently negative. A transfusion was given at the end of the first week, and her general condition steadily improved.

Operation and Result.—On the thirty-fifth day after admission, and when the hemoglobin was 78 per cent and the red blood cell count was 4,390,000, operation was performed.

Under general anesthesia through a lower right rectus incision a Meckel's diverticulum was found 22 inches from the ileocecal valve, attached at a point along its circumference anteriorly and immediately adjoining the mesentery. It measured 2 cm. in length and had a base 1 cm. in diameter; its tip was so flat that it presented the appearance of a tiny "stove-pipe" hat.

It was removed by simple excision, and care was taken not to leave any of the diverticular wall. The edges of adjoining ileum were inverted and closed by means of a purse-string suture of linen, reenforced by two rows of tanned catgut. The appendix was then removed in the usual manner and the abdomen closed.

Grossly the body of the diverticulum showed numerous prominent rugae on its mucosal surface, which diminished in size as the neck was approached. Many pinpoint hemorrhagic areas could be detected in the mucosa.

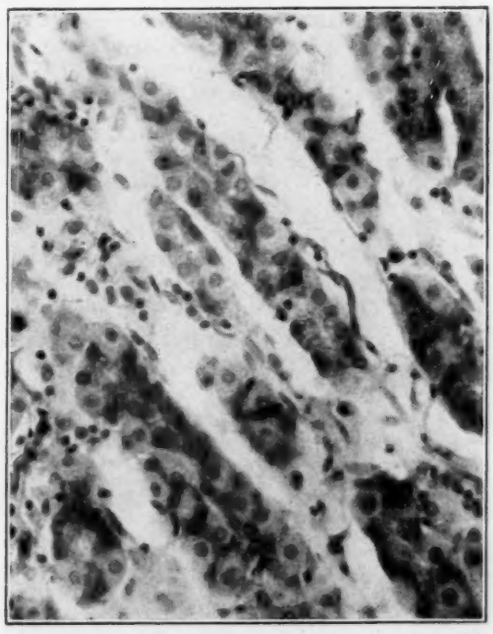

Fig. 4.—Tubular glands showing chief and parietal cells (×200).

Microscopically the section showed a transition from intestinal mucosa to that of stomach mucosa, as it passed from the neck into the body of the diverticulum. The gastric mucosa showed the typical glandular formation, with the tubules lined by chief and parietal cells. The glands were numerous and the acid cells stood out prominently. No pancreatic tissue could be found.

A definite peptic ulcer was found, which was in a healing phase. Beneath the ulcer base a large artery could be seen with fibroblastic invasion filling two thirds of its lumen; it was logically assumed that this represented the amount of healing and obliteration of the artery that had taken place since the child last gave evidence of hemorrhage.

The child made an uneventful convalescence and has been symptom free ever since.

COMMENT

This case illustrates the one variety of Meckel's diverticulum in which a preoperative diagnosis can be made; in doing so, emphasis is to be made on the history, the character of bleeding by rectum and the essential lack of physical changes.

This case adds another one to the mounting list of Meckel's diverticula already reported in which aberrant mucosa lining the diverticulum has been almost universally present.

107 East Sixty-Seventh Street.

Special Clinical Article

AUTOMOBILE INJURIES

CLINICAL LECTURE AT ATLANTIC CITY SESSION

CLAIRE L. STRAITH, M.D.
DETROIT

Were it not for the possibility that a gloomy forecast on the future of medicine might be expected, I would have entitled this paper "Surgery at the Crossroads." This title, properly interpreted, presents graphically what I consider one of the most pertinent problems of present day medicine: the proper care and management of the ever growing numbers of victims of motor car accidents. This surgical problem has its origin on the highways, commonly at the crossroads. It is there also that the victims receive preliminary treatment, and it is from there that they carry away, too often it seems to me, preventable and deplorable aftermaths. That is my interpretation of "Surgery at the Crossroads." I know of no other aspect of modern surgical practice which requires greater emphasis and merits greater effort toward enlightenment of the general public as well as of the members of the medical profession. Other surgical problems commonly discussed (appendicitis, for example), numerically at least, fade into insignificance when compared with the rising toll of automobile injuries and their devastating physical and psychologic sequelae.

To emphasize the need of studying this modern surgical problem, I shall cite a few figures. During the past year, 38,500 deaths resulted from automobile accidents alone. The total number of nonfatal accidents was 1,340,000, of which 110,000 resulted in permanent disability. Present figures indicate a 28 per cent increase in deaths for the present year. If these figures are compared with those showing the progressive decline, year by year, in mortality and morbidity from diseases and other hazards, the contrast is startling. What a hue and cry would be raised if typhoid fever or smallpox were to bring a similar epidemic of death or disability, or even a much lesser one! In its most destructive years, the "white plague" was hardly more devastating.

For this gloomy picture in an era of supposed enlightenment and progress, many obvious causes can be listed. One of the chief is progress itself. The ability of the engineer to design, and of the industrialist to make easily available, speedier and ever speedier motor vehicles far surpasses the intellectual ability of the average man to utilize them safely. Man's ingenuity has enabled him to perfect a Frankenstein's monster which now turns about to destroy. Mechanical progress has become a double edged sword. Added to the mechanical perfections which permit greater speed are the splendid new highways which encourage it. Safety features incorporated in motor cars of modern design, however fool proof in the hands of the sane and sober driver, are of little use in the hands of the moron. The shortcomings of laws and law-enforcing agencies are, of course, apparent. Laxity in granting driving permits to the physically and mentally handicapped, failure to punish adequately the traffic offenders and granting of permits to chronic violators—all these and many other factors serve to handicap the splendid efforts of safety engineers and traffic experts, who are confronted by the impossible task of making a powerful machine fool proof for fools. The factor of intellectual irresponsibility is, however, no greater than that of moral irresponsibility. The rôle of alcohol in the present rise of automobile accidents is illustrative of the latter. The drinking driver is an important factor in automobile mishaps. Studies show clearly a decided increase in the number of accidents during the "cocktail hour," in the late afternoon, and late at night, "after the brawl is over," so to speak. The holiday mood of the week-end, with its carefree jollity and attendant inebriety, provides somber headlines for "blue Monday's" newspapers. The situation is not merely a national one. Similar accounts are emanating from England and the continent. Whether legislation or engineering can do more seems doubtful. A moral renaissance of the general public is the one thing needful.

Such then is the situation which prompts me to discuss the surgical problems developing in ever increasing numbers on the highways and at the crossroads. The problems which concern the physician especially are those dealing with the surgical care of the injured. This phase is as much in need of more intelligent thought as are the phases concerned with regulation of traffic, licensing of drivers and punishing of offenders. It is a more hopeful one, because its message is directed toward a profession whose group conscience and intelligence are amenable to suggestions and prompted by a desire for betterment.

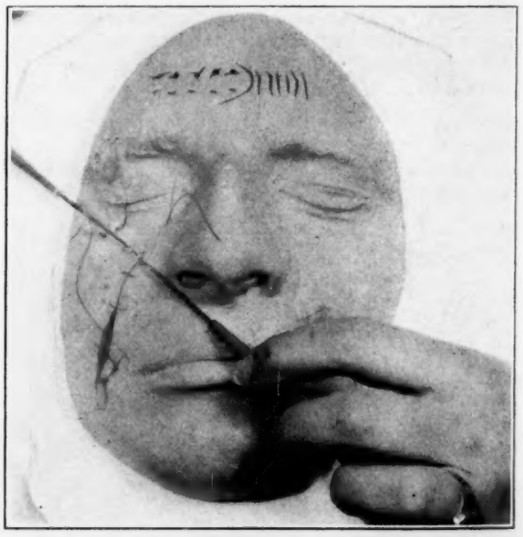

Fig. 1.—Delicate handling of wounds is of extreme importance. On this gelatin model note the use of small horsehair mattress stitches to prevent inversion of the wound edge; double twisted, but single tied horsehair stitches, for accurate wound approximation. The use of fine hooks avoids skin trauma. A double subcuticular stitch is used to produce a fine line scar with practically no stitch marks.

The large variety of injuries which may be encountered as a result of traffic accidents defies any attempt to discuss the subject comprehensively. I shall therefore give particular attention to a consideration of facial injuries, leaving the discussion of important traumatic lesions involving other portions of the body to more competent hands. My discussion of even such a limited subject as injuries to the face must be cursory. I shall confine myself largely to a consideration of the basic principles of treatment.

Facial injuries sustained in motor car accidents may be divided roughly into two main groups: those sustained by pedestrians and those sustained by occupants

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of automobiles. The first group is not clearly defined, owing to the great variety of objects which may inflict the injury (bumpers, radiator grills, door handles) as well as to the trauma which results when the body of the victim is dragged along the ground or pavement (brush marks, cinder marks). The second group (i. e., injuries to occupants of cars) is more distinct, and the injuries are of two general types: (1) those sustained by other occupants of the motor vehicle ("guest-passenger injuries") and (2) those sustained by the driver ("steering post injuries"). The lesions sustained by the driver and the guest passengers are different both as to cause and as to the type of involvement. I shall discuss these injuries presently, after considering, first, certain basic principles of first aid treatment.

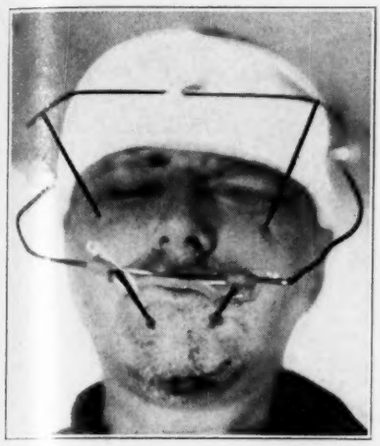

Fig. 2 (patient E. P.)—Note the wire attachments on the head cast to which traction wires were attached, pulling the maxillae up and the mandible forward.

The first principle of treatment at the time of the accident involves a knowledge of what must be treated and what, in the interest of the patient's safety, should be left alone. *Primum non nocere*—first of all do no harm—is an ancient medical adage which is especially applicable here. In the excitement of the occasion well intentioned persons (lay and professional alike) often jeopardize by hasty action the patient's chances of recovery. I need scarcely point out the dangers of energetic manipulation and hasty transportation in the presence of shock or serious head injury. Such warnings have been made repeatedly. Except in the exigency of a severe, life-threatening hemorrhage, the patient in shock had better be kept quiet and warm at the roadside or in a nearby dwelling rather than be bundled post-haste to a distant hospital, even by ambulance. Mock's slogan, "A live skull fracture in a farmhouse is better than a dead one in a hospital," applies to head injuries accompanied by shock. Mock's warning about the danger of immediate operation in the case of skull fracture is also applicable to facial injuries. "Haste lays waste" (if I may be permitted to paraphrase an old proverb). It is safer to wait for a good opportunity to do good work than to perform a hasty so-called emergency operation on a patient in poor condition under adverse circumstances. Serious hemorrhage is practically the sole emergency which requires immediate treatment of a heroic nature. Every facial injury accompanied by loss of consciousness should be considered a potential skull fracture and treated as such until proved otherwise.

The second principle in the first aid treatment of facial injuries is cleanliness. The simple expedient of applying a sterile or clean compress over a lacerated area will accomplish two things: 1. It will usually control superficial bleeding. 2. It will guard against further contamination of the wound. This suggests the desirability of every car carrying a simple first aid packet with at least a clean dressing and bandage in it. Immediate closure of the laceration should not be attempted. Before any effort is made to suture the wound, it must be thoroughly cleansed. This applies also to the surrounding skin. Foreign bodies (dirt, glass, splinters, cinders) must be carefully removed. Primary healing is impossible without these precautions, which can be observed only in a properly lighted and well equipped operating room of a hospital or surgical office.

The third principle in the treatment of facial wounds is concerned with end results. Every effort should be made to minimize scar formation. To accomplish this aim, closure of the wound should be attempted only under conditions which permit thorough cleansing of the laceration. But this is by no means all. The surgical technic employed is of the utmost importance. The use of skin clips, large needles, coarse suture materials (silk, catgut, silkworm gut) and crude instruments which intensify trauma of the tissue must be condemned. Delicate instruments, fine needles and suture materials and a proper regard for tissues are necessary. Scrupulous attention to details is essential. No precaution is trivial. The neglect of cinder and brush marks, for example, leaves telltale bluish or black streaks in the surrounding scar and skin which call attention to an otherwise inconspicuous defect. The simple expedient of scrubbing away these marks with a stiff brush soaked in soap and water while the patient is under local anesthesia will remove what would otherwise remain as a permanent discoloration, a permanent reminder of neglect. The attainment of minimal scars necessitates an "infinite capacity for taking pains." The use of local anesthesia, incidentally, is a distinct aid in insuring good results: first, because it enables the surgeon to cleanse the wound thoroughly and painlessly; second, because it enables him to take time. Before closure is begun, the edges of the skin should be trimmed so that when they are approximated the wound is straight rather than jagged. Fine hooks or delicate tissue forceps should be used to avoid traumatizing the border of the skin. Exact approximation of the wound is best accomplished, I believe, by means of a double subcuticular stitch—the deeper one of a heavy material

Fig. 3.—From the bicuspid region on the arch bar, a traction wire is passed through each cheek by means of a surgical needle.

such as dermal and the superficial one (just beneath the surface of the skin) of thin horsehair threaded on a semicurved needle with a small eye (fig. 1).

Heavy dressings are always possible sources of infection, especially in wounds near the mouth, where they can readily become contaminated. Lighter dressings are therefore more desirable. A single thickness of gauze held in place by collodion gives suitable protection. The patient is instructed to apply an ice bag over the wound for at least twenty-four hours after closure

to minimize the resulting edema. So much for minor injuries and first principles.

The severe crushing facial injuries present major surgical problems with wide ramifications. Associated skull fractures are of course frequently present and must be suspected, as I have said, whenever loss of consciousness is present, or when bleeding (from nose,

Fig. 4.—Fixation is made possible by embedding coat hanger wire with suitable projections into the plaster cast.

mouth or ear) and respiratory difficulties are encountered. Hasty transportation and brusk, ill timed examinations may endanger life. Extreme caution in this regard cannot be too strongly emphasized. Special examinations and x-ray studies should be delayed until the primary shock has passed. When this stage has

Fig. 5.—Author's method. Special head band is embedded in the plaster cast. The traction wires are fixed to wires on the head band. The exact amount of traction to bring the teeth in proper occlusion is determined before attaching wires to head band.

been reached, and only then, is detailed examination permissible. Examination must be thorough; inspection, palpation, x-ray visualization and neurologic survey are all important and fundamental to the last step, which is treatment. The type of treatment to be instituted depends on the nature of the injuries or groups of injuries encountered.

Of the severe crushing types of facial injuries sustained in motor car accidents, the steering post injuries, involving the driver, and the guest-passenger injuries, affecting particularly the person riding beside the driver, are the most commonly observed varieties. The latter type is more frequent and generally more severe. The reasons for this difference are obvious, since the driver is afforded at least relative protection by the steering wheel, to which he may cling for support during the impact. Indeed he may, as not infrequently happens, escape injury altogether. In cases, however, in which the driver has relaxed his grip on the wheel or falls asleep or in which the collision is unusually severe, the typical steering post group of injuries may result. The mechanism for their production is clear. When the impact occurs, the head and the upper part of the trunk are propelled forward violently, so that the head strikes on the wheel. This results in injuries involving chiefly the lower third of the face; lacerations of the chin and fractures of the mandible and necks of the condyles. When the entire face strikes the wheel, more extensive injuries naturally follow: fractures of the nose, malars

Fig. 6.—Crushed nasal bones are elevated and supported laterally by the author's nasal fracture appliance.

and maxillae. Associated fractures of the ribs, sternum, knees and ankles are not uncommon.

Let me cite a typical example of the steering post type of injury. The treatment which was instituted in this case will serve to illustrate many points of practical importance in the management of similar cases:

Patient E. P. fell asleep while driving. His car hit a steel post with such force that his face was crushed by striking on the steering wheel. In this case the injuries were more severe than usual because the patient, being asleep, could not brace himself against the force of the impact. The chin, nose, cheeks and upper jaw received the brunt of the injury.

He was first seen a few hours after the accident, fully conscious and not in shock but with his face swelling rapidly to a point beyond recognition. He was examined immediately. The facial bones were first carefully palpated. This is important, since x-ray examinations often give negative or inconclusive evidence as to the existence of fractures of these bones. Using the two index fingers simultaneously, the operator carefully felt the orbital rims. Next, the malar attachments were examined. A depression of the left malar eminence was noted. This was accompanied by the usual anesthesia of the lateral aspect of the nose and upper lip that is associated with fractures extending through the infra-orbital foramina. The zygoma was next examined and showed tenderness over the region of the left malar articulation. Palpation of the nasal bones revealed multiple fractures, with deviation of the nose toward the right side.

The oral cavity was next examined. Extreme mobility of the maxilla, occasioned by both a transverse and a midline fracture, was disclosed. The left maxillary bone was crushed, as was evidenced by sharp fragments of bones the edges of which could be palpated beneath the mucosa overlying the fractured left malar. A laceration of the chin (typical of steering post injuries) was present. This overlay a fracture of the mandible extending through the symphysis and resulting in posterior displacement of the entire jaw and tongue, giving rise to difficult respiration. Palpation over both temporomandibular joints elicited bilateral tenderness and crepitus, denoting fractures through the necks of both condyles. X-ray examinations verified these observations. Later in the day, serious respiratory difficulty brought about by the posterior displacement of the mandible necessitated immediate intervention.

Fig. 7.—Full thickness defects of the ala and other structures are best treated by sewing mucous membrane to the skin edge around the defect and relying on a subsequent plastic repair. A plastic rule, "Never distort tissue to close a defect," applies here. The immediate closure of this defect would badly distort the nasal tip.

The following treatment was carried out:

With the patient under local anesthesia, the left malar bone was elevated into normal position by passing a strong curved instrument (trocar) through the mucosa inside the cheek behind the last upper molar. Upward pressure on the lower surface of the depressed malar bone corrected the deformity. This relatively simple maneuver usually suffices to produce complete correction and prevents what would otherwise result in an unsightly flat cheek. It should be carried out as early as possible after the injury, since it becomes technically more difficult, if not impossible, after long delay.

The fractured left maxilla was next brought forward and held in position by wiring the teeth to a steel arch bar. From this bar a double fracture wire was then passed upward through the cheek on a long needle. Upward traction on the wire corrected the maxillary depression. Upward traction was maintained by fixing the wire to a plaster cap, which I shall describe presently. Meanwhile the fractured mandible was treated in a similar manner by wiring the teeth to an arch bar which served to bring the fragments into proper alinement. The respiratory difficulty caused by the fractured condyles necessitated holding the jaw forward. This was accomplished by attaching a wire to the cuspid region on each side and passing the wires through the lower lips. Forward traction on these wires held the jaw forward. The fractured nasal bones were alined by manipulation.

To maintain the normal position of the maxillae and the mandible through continuous pull on the wires the application of which I have described, some form of fixation is necessary. A plaster head cap is the most satisfactory method of providing fixation points. Properly applied, the cap fits closely on the head and extends if possible below the occiput and behind the mastoid processes. It must be padded lightly and have no projecting objects on its inner surface.

The plaster cap is made by covering the head first with stockinet and next by a few turns of cotton wadding. This is covered with 4 inch (10 cm.) plaster bandage. Attachments for the traction wires pulling the maxillae upward and the mandible forward are embedded in the plaster while it is still relatively soft. Coat hanger wire, which is generally readily available, may be used to provide fixation points. A much better method is the use of a radio binding post mounted on a metal band which is embedded in the plaster. Better still, according to my experience, is the special head band which I have devised, which permits a number of attachments. After these attachments have been fixed in the plaster, the cap is completed by turning the edges of the stockinet up and catching the edge beneath the final turns of plaster bandage (figs. 4 and 5).

Fig. 8.—Subsequently, lining flaps were inverted and a full thickness graft from behind the ear was used to cover the defect. The graft matches well and no distortion is produced.

When the cap has dried thoroughly, the traction wires on the maxillae are fixed to the attachments on the head cast. Traction on the upper jaw can readily be

increased or diminished by adjusting the pull of these wires. Backward displacement of the jaw (which caused respiratory distress) was prevented from recurring by making an anterior arch of coat hanger wire to which the traction wires (fixed to the cuspid teeth and passed through the lower lip) were attached by elastic traction. This contrivance held the jaw forward

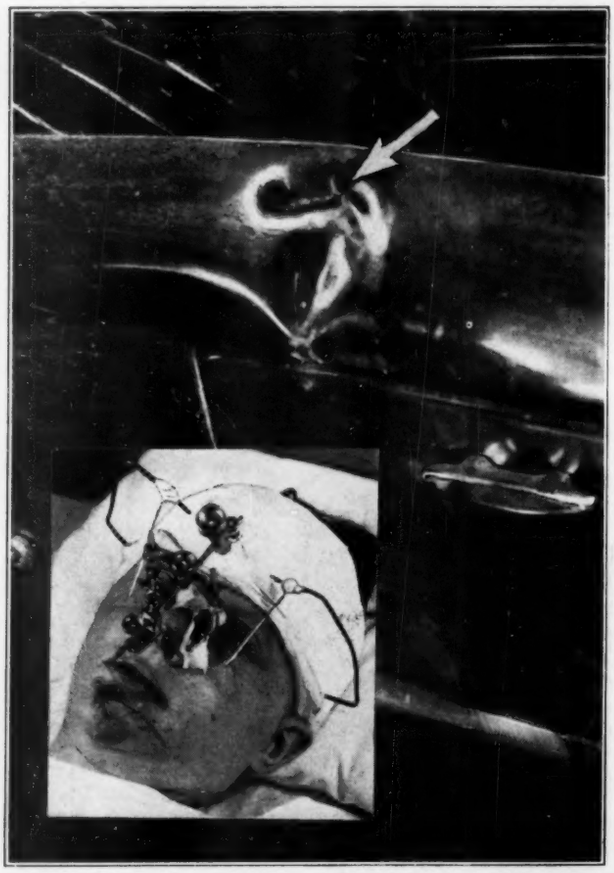

Fig. 9.—Note tooth marks on the instrument panel. This injury resulted in the loss of all the front teeth, fracture of the maxillae, malar and nasal bones, and laceration of the chin. The rigid instrument panel is a great source of injury to guest passengers in the front seat. Inset shows patient treated with maxillary traction wires and author's nasal appliance.

and permitted the patient to lie in bed comfortably without experiencing the choking sensation occasioned by the posterior displacement of the mandible. Elastic traction between the upper and the lower arch bar later regulated the dental occlusion so that all the patient's teeth could be saved and a normal "bite" maintained. The depressed fracture of the malar bone was also completely corrected, so that no residual deformity remained as a result of a large series of fractures of facial bones. So much for the management of steering post injuries in particular.

Guest-passenger injuries are unfortunately even more frequent and more severe. Fully 75 per cent of the persons with the more serious crushing facial injuries under my care are young women, guest passengers who occupy the front seat beside the driver. The injuries which they receive are so typical that they have come to be recognized as a distinct type. This is because they are caused by other factors than those which bring about steering post injuries. When the impact occurs, the guest passenger (who has nothing comparable to a steering wheel to which to cling for support) is thrown violently forward against the windshield or instrument panel, with resulting injury to the middle third of the face. Crushing of the nose, cheek bones and maxillae, facial lacerations and rupture of the eyeballs result. The seriousness of many of these injuries could be greatly minimized if projecting handles, knobs, cranks and other fixtures on the instrument panel and doors could be eliminated entirely or altered in construction. It seems possible that many if not most of these projecting fixtures could be recessed or made flush with the body of the car. Heavy metal robe rails have caused serious facial injuries to occupants of the rear seat. Removal of these rails entirely or substitution of soft materials (e. g., leather straps or cords) would easily prevent such injuries.

For several years I have had crash padding installed in my own cars to cover prominent portions of the instrument panels for the protection of children and other guest passengers. Designers of automobiles should, I believe, make further efforts to eliminate these hazards by some such means (fig. 10).

The treatment of guest-passenger injuries does not differ, in principle at least, from that which I have recommended for injuries of the steering post variety. The same careful examination is essential to determine the individual treatment required.

Depressed malar bone fractures are treated in the manner I have described. Maxillary fractures may be corrected by traction wires passed through the cheeks and attached to an arch bar.[1] This arch bar can easily be applied by twisting a 20 gage silver or ordinary wire around the last molar tooth on each side. The four wires are then united in the midline by being twisted together in front of the teeth. Each tooth is then wired firmly to the arch wire.[2] The traction wires attached to the arch bar and passed through the cheeks are later fixed to the plaster head cast as I have suggested.

Maxillary impaction, causing upward and backward displacement of the jaw (so that the anterior teeth are separated and the molars approximated), is not an uncommon complication. The impaction should be

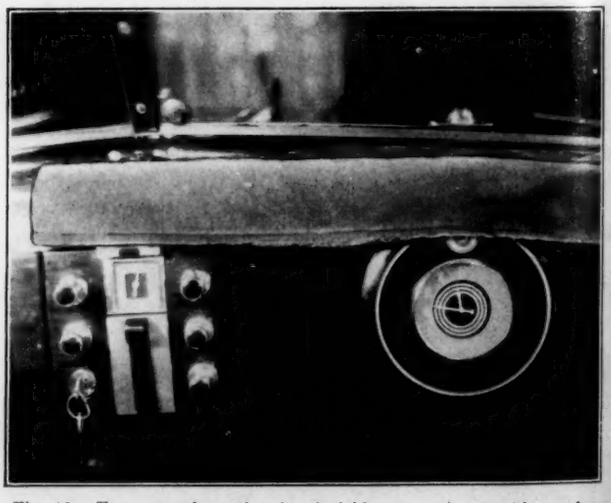

Fig. 10.—For years the author has had his car equipped with a velure covered sponge rubber pad to cover the upper portion of the instrument panel. Certainly, this should at least minimize a guest passenger's injuries.

freed by manual manipulation. Elastic bands are then applied between upper and lower arch bars to draw the upper arch down and forward. If this correction is carried out early, the maxillae may be restored in from twenty-four to forty-eight hours to normal position. If the condition is left untreated, however, a most troublesome malocclusion will result.

1. Feiderspiel method.
2. Risdon's arch bar method.

Fractures of nasal bones should be reduced with the patient under local anesthesia with procaine hydrochloride. The nasal framework is first elevated and reshaped as well as possible. Elevation of the fragments must then be maintained. This may be accomplished by intranasal packing, which, however, has the obvious disadvantage of obstructing drainage. To obviate this disadvantage I have devised a nasal splint assembly which permits ample drainage and, at the same time, elevates the nasal bridge and provides lateral pressure to reshape the nose. This splint assembly is employed after the application of a plaster head cast. It is usually left in place for approximately three weeks. Hemorrhage within the antrum, a common complication of injuries of this type, may necessitate puncture of the antrum to provide drainage. Congestion and tenderness of the nasal mucous membrane will require the administration of astringent nasal drops.

Lacerations of the skin should be sutured as I have previously recommended. Severed pieces of skin or partially detached fragments should have careful attention. Flaps with apparently adequate circulation should of course be preserved. Detached or apparently nonvital flaps can be used as Wolfe grafts; all fat tissue is first removed, and the skin is carefully sutured into the defect. A pressure dressing is then applied.

Actual losses of skin should be restored at once if possible. Small losses of facial skin can be restored by grafts taken from the upper lid or from the skin behind the ear. These grafts are carefully sutured in place and covered by a pressure dressing. Tying the sutures over a small gauze pad in a good method of insuring adequate pressure. Such dressings should be left in place at least one week (figs. 7 and 8).

SEQUELAE

Despite the physician's best efforts, it must be admitted, unsightly scars will occasionally develop. These should later be carefully excised. The time for secondary plastic procedures is at least two months after healing has taken place. Here also, the subcuticular stitch is recommended for closure to obtain minimal scar formation.

Crushed noses and depressed cheek and frontal bones also require attention. Transplants of rib cartilage may be used to fill in these defects. The transplant of cartilage may be taken from the patient, or from another person provided the Wassermann reaction of his blood is negative. Following Pierce's example in using preserved human cartilage, I have been using cartilage that has been preserved and refrigerated for several months. Although this is meeting with apparent success, I still regard it as somewhat experimental.

Severed noses, especially in males, are distressing deformities. Attempts should be made to reconstruct missing portions. I shall not try to discuss the details of this plastic procedure. Complete nasal losses provide even more urgent indications for restoration. If a good lining is present or easily provided, Wolfe grafts may be used to good advantage if the loss is not too extensive. Larger losses can be replaced only by pedicle grafts. The forehead flap method is best suited to women because it provides hairless, well matched skin. The resulting scar on the forehead is readily concealed by the hair-dress. In men, however, the scar on the forehead is almost as obnoxious as the nasal disfigurement itself. Hence I prefer to use a flap formed from the skin just below the ear and overlying the sternocleidomastoid muscle. This is generally quite free from hair and closely matches the facial integument. The graft is brought to the face via a tube pedicle attached primarily to the region of the sternal notch. From this point it is secondarily attached to the nose. It is easily molded and gives admirable results, as I have been able to demonstrate in several instances. The resulting scar on the neck is inconspicuous.

I wish to emphasize the fact that many other medical aspects of the problem of motor car accidents need earnest consideration. One of the most pertinent of these concerns the mental and emotional health of the many victims. Above and beyond the physical suffering which they must endure as a result of horrible injuries such as I have described is the mental agony which lasts throughout life in the presence of facial disfigurements, however slight. Complexes and near psychoses brought about by brooding over facial disfigurements have removed many of these unfortunates from active social and business activities. That their worries are not unfounded, on the whole, is borne out by the fact that employers place a high premium on good appearance in selecting employees who must meet the public. How large a part these injuries have in contributing to the ranks of the unemployed and unemployable can only be conjectured. It is undoubtedly a large one. For this, as well as the many other reasons I have attempted to convey, I submit that "Surgery at the Crossroads" is an important aspect of modern life which merits earnest consideration.

1713 David Whitney Building.

Special Article

PHYSICAL AND PHYSIOLOGIC PRINCIPLES OF AIR CONDITIONING

PART II

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WINTER AIR CONDITIONING

Comfort as Affected by Method of Heating.—The object of air conditioning for human comfort is not to heat or cool the body but to control its rate of heat loss within certain limits by methods that are most conducive to comfort and health. Temperature and humidity are means to an end. Their values depend on the system used, the main objective being the comfort and health of the individual.

Heating systems are usually designed on a basis of warmth rather than of comfort, although the two terms are often used synonymously. The basic assumption is that the degree of warmth or comfort experienced depends solely, or largely, on the rate of heat loss by radiation and convection combined, irrespective of their relative proportions. This is not necessarily true. A room with walls and ceiling uniformly at 80 F. and air at 60 F. is as warm as one with all surfaces at about 62 F. and air at 80 F., but the comfort experienced under the two conditions differs appreciably; the first room is fresh and pleasant, while the second one is stuffy and depressing. Heat loss by radiation and convection combined is approximately the same in the two rooms, but in the first the loss is by convection alone

This is the second report of the committee established by the American Medical Association to study air conditioning. The first report appeared in THE JOURNAL May 15, 1937, pp. 1708-1713. The committee includes Carey P. McCord, Detroit, chairman; Emery R. Hayhurst, Columbus, Ohio; William F. Petersen, Chicago; Horatio B. Williams, New York, and Constantin P. Yaglou, Boston.

and in the second by radiation alone. Heat loss by evaporation is assumed to remain constant in both instances.

Although a combination of warm walls and cool air is unquestionably more comfortable and pleasant than one of cold walls and warm air, the former is difficult to maintain in many buildings, as there is no way to prevent the heated walls from raising the temperature of air without wasting energy. A remote approach to the former method, known as radiant heating, is employed to some extent in England by attaching low temperature heating panels to the ceiling and sometimes to the walls whereby the mean temperature of the room surface is kept just a few degrees above the air temperature by means of radiant heating alone. Much of the freshness claimed for these systems is thus lost in the practical application of the principle. In a physiologic study of radiant heating in various buildings, the Vernons [1] found little confirmation of any inherent qualities claimed to be conducive to comfort and to insure comfortable conditions at temperatures much below the customary degree.

Developments in the United States have proceeded mainly along the lines of convection heating (warm air, hot water or steam radiators), in which the temperature of the air is usually a few degrees higher than the temperature of the walls, although in buildings of poor construction the difference may be as high as 15 degrees F. or more, approaching the undesirable extreme just described. With the exception of southern parts of the United States and sections along the Pacific Coast, it is doubtful whether radiant heating as used in England can be satisfactorily adapted to the colder sections in this country without being supplemented by ordinary radiators under windows for counteracting the downdraft of cold air leaking through window and door cracks. Another objection is the difficulty of producing a uniform radiation effect on all occupants of a room and over the body surface of each occupant by radiant heat alone. As an auxiliary source of heat, however, portable electric heaters of the radiant type are most useful in furnishing extra heat in nurseries and in rooms of the aged or ill.

No general agreement exists as to which of the three convection heating systems is the best from the standpoint of comfort and health, although the direct hot water system has many good features to recommend it. It provides a small amount of radiant heat which permits a reduction of from 1 to 2 degrees F. in the temperature required for comfort by comparison with warm air systems, without, at the same time, overheating the air passing over the radiators to the point of scorching dust and soot. When the temperature of the radiator surface exceeds 150 to 175 F., ammonia and various hydrocarbons are volatilized from atmospheric dust and soot, and the products irritate the mucous membranes of the nose and throat, resulting in complaints of excessive dryness.[2] If radiant heating is desired, greater possibilities would seem to lie in supplementing low temperature convectional systems with a truly radiant source in the form of ceiling lamps, which in addition to infra-red would supply visible and ultraviolet radiations in suitable proportion.

Comfort as Affected by Building Construction and Insulation.—The kind and quality of building materials used for walls, ceiling and floor have an important bearing on the comfort and heating economy of a building and probably on its healthfulness also. The main reason why some rooms must be kept between 75 and 80 F. to make them comfortable in cold weather is to compensate not for the low humidity, as is often contended, but for the cold walls and glass in buildings of poor construction.

According to Kratz's [3] experiments, when the outside temperature is 0 F. and the inside 72 F., the inside surface temperature of a typical exposed frame wall is 60 F. with no wind and 55 F. with a wind velocity of 10 miles an hour. A room with three such exposed walls is uncomfortably cold at 72 F., and to make it comfortable at all the temperature must be increased to between 77 and 80 F.

If, however, this typical frame wall is insulated by filling the studding spaces with insulation, the temperature of the inside surface of the exposed walls would be about 68 instead of 55 and the room would be comfortable with air at from 72 to 73 instead of from 77 to 80 F.

Ordinary single-pane windows are often more troublesome than cold walls in rooms having a number of windows. With an outdoor temperature of 0 F., Kratz [3] observed a temperature of 18 F. on the inside surface of the glass. By installing tight-fitting storm sashes, the temperature on the inside pane surface increased to 44 and the infiltration of cold air was practically eliminated.

An illusive feature in the heating of rooms with cold walls and glass is that the ordinary thermometer is not affected as much as the human body by these cold surfaces. Special instruments [4] are necessary for indicating the influence of such cold surfaces on warmth and comfort.

Aside from the direct effects of negative radiations, uninsulated cold walls and windows chill the air in contact with them and allow considerable leakage of outside air. This cold air in falling to the floor produces uncomfortable drafts and a steep temperature gradient from floor to the breathing zone, which often results in stuffiness and congestion in the nose.

Adequate building insulation not only materially improves the comfort of rooms but also effects a substantial saving in fuel consumption by reducing structural heat loss and by permitting a lower room temperature. The size of the heating plant, including boiler, radiators and pipes, is considerably reduced and the total savings will pay for the cost of insulation in a few years. In warm summer weather the insulation will keep the house cool. While the monetary savings are generally recognized by the engineers, the benefits to comfort and health have not been fully appreciated in the past, particularly by the layman.

Humidification.—Artificial humidification, about which so much is heard in connection with winter air conditioning, was shown in the first part of this paper [5] to be relatively unimportant from the standpoint of comfort and, so far as is known, not essential from the standpoint of health.

While a relative humidity of between 40 and 60 per cent would probably be more normal and perhaps more healthful than one between 20 and 30 per cent, it is practically impossible to maintain this high range in

1. Vernon, H. M., and Vernon, M. D.: A Physiological Investigation of the Radiant Heating in Various Buildings, Report 46, Industrial Fatigue Research Board, London, H. M. Stationery Office, 1928.
2. von Esmarch: Hyg. Rundschau, 1905.
3. Kratz, A. P.: Physical Factors Affecting Comfort, Bull. 34, University of Illinois. Oct. 13, 1936, p. 26.
4. Yaglou, C. P.; Kratz, A. P., and Winslow, C.-E. A.: Instruments and Methods for Recording Thermal Factors Affecting Human Comfort, Year Book A. P. H. A., 1936-1937, p. 84.
5. Yaglou, C. P.: Physical and Physiologic Principles of Air Conditioning, J. A. M. A. **108**: 1708 (May 15) 1937.

cold weather on account of excessive condensation and freezing on the windows and sometimes inside the exposed walls.

Kratz [3] has shown that with an outside temperature of 0 F. the indoor relative humidity at which frost or condensation will appear on window panes is about 15 per cent with single glazed windows and 40 per cent with a tightly fitting storm sash. With an outside temperature of 20 F. the corresponding limits are 25 per cent and 50 per cent respectively.

More serious is possible damage to exposed walls and roof by absorption and penetration of moisture. Fungous growth or chemical disintegration may result from accumulation of condensed water in certain building materials composing the outside walls. The wallpaper may loosen. Moreover, if the water should soak through to the outside sheathing, frost may cause serious damage.

Artificial humidification, therefore, is not recommended in buildings of usual construction, as the natural humidity prevailing there is as high as can be carried safely. If humidification is desirable, the building must be specially designed and built, with suitable insulation and moisture proofing of all exposed surfaces. The attic space must be well ventilated or else no humid air must be allowed to escape there. Even with these precautions, relative humidities in excess of 40 per cent are not to be recommended in cold weather.

Theoretically, humidification makes the air feel comfortable at a somewhat lower temperature, but under practical conditions the effect on comfort is quite small, almost imperceptible by the average person. An increase of 20 per cent in the relative humidity (from 20 per cent to 40 per cent), the maximum increase allowable in cold weather, permits a temperature reduction of but 2 degrees F. from about 72 to 70 F.

No fuel economy results from this reduction in temperature, as it takes more fuel to raise the humidity 20 per cent than to keep the building at a temperature 2 degrees F. higher. While on first thought one would expect a material reduction in heat loss from the structure, when the temperature is lowered 2 degrees there is a simultaneous increase in the heat conductivity of building material with humidity,[6] the importance of which is not appreciated at present.

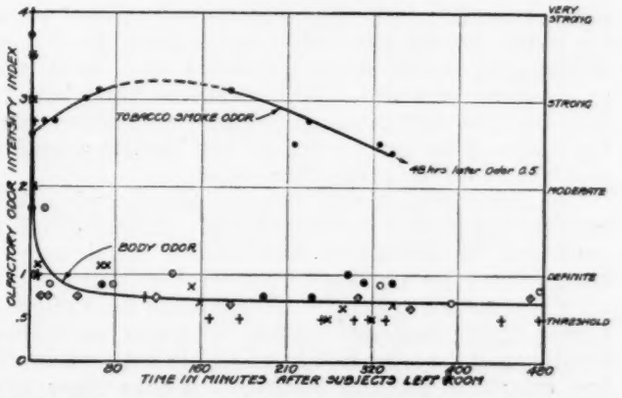
Ventilation.—Artificial ventilation and air filtration are necessary in theaters and auditoriums, where large volumes of air must be regularly supplied, but in homes and uncrowded offices such provisions are of doubtful value, except under unusual circumstances.

The average house has too much air leakage to require artificial ventilation during the cool season of the year. The leakage usually amounts to between one and two air changes per hour. By the use of weatherstripping or storm sash and storm doors, it may be reduced to half an air change per hour and still be sufficient for all practical purposes. Exceptions may arise in the kitchen and bathroom, which in any case must be separately ventilated by means of open windows or a small exhaust fan built into the outside wall or in the upper half of the window.

After a long period of speculation concerning ventilation requirements, in public buildings (schools, theaters and offices) the prevailing concept is that in most instances body odors constitute a limiting factor, fixing the minimum amount of fresh air necessary. This is because it is possible to heat, cool, humidify or dehumidify the air of a room without necessarily introducing outside air, but the most effective and practical method for removing odoriferous matter at present is by dilution with clean outdoor air. Washing the air with a clean water spray is also effective in removing some of the odor, thus reducing the outdoor air requirement.

Until recently an outside air supply of 30 cubic feet per minute for each person was thought necessary for good ventilation on purely chemical and physical grounds. Recent experimental evidence [7] showed this quantity to be excessive in many instances from the standpoint of every practical need. It also showed that it is impossible to fix any single value that would apply to all cases.

Accepting the present concept of body odor as a limiting factor in the ventilation of public buildings, the amount of outside air required to remove objectionable odors was found to vary mainly according to the type of building and air conditioning apparatus, the air space in a room per occupant, the room temperature, and last, but not least, the socio-economic status of the occupants, especially the bathing habits and cleanliness of clothing. The variation is from a minimum of about 5 cubic feet



Rate of disappearance of body odor and odor of cigaret smoke in a closed room. Different points represent experiments at different seasons of the year.

per minute for each person in spacious living rooms and offices to a maximum of 40 cubic feet per minute for each occupant in crowded schoolrooms attended by children of the poorer class. In the latter case the problem is one of personal sanitation rather than of ventilation.

The influence of per capita air space on fresh air requirements arises from the fact that body odors are not stable but tend to disappear rapidly of their own accord,[8] as shown in the accompanying chart. Large rooms have an advantage over small ones as they act as reservoirs, allowing body odors to disappear with a minimum outdoor air supply. On the other hand, smoking rooms should be made as small as possible and ventilated fast. This is not only because the odor of tobacco smoke remains longer in the air but because its intensity increases during the first three hours following the smoking period, an observation which agrees with the common experience that the odor of stale tobacco smoke is more offensive than that of fresh smoke.

The usual ventilation requirements in public buildings where people do not smoke are between 10 and

6. Berestneff, A. A.: Moisture—Its Influence on the Heat Conductivity of Building Materials, Heating & Ventilating **29**: 27 (April) 1932.

7. Yaglou, C. P.; Riley, E. C., and Goggins, D. I.: Ventilation Requirements, Am. Soc. Heating & Ventilating Engineers, Journal Section, Heating, Piping and Air Conditioning **8**: 65 (Jan.) 1936.

8. Yaglou, C. P., and Witheridge, W. N.: Ventilation Requirements: Part 2, Am. Soc. Heating & Ventilating Engineers, Journal Section, Heating, Piping and Air Conditioning **9**: 447 (July) 1937.

20 cubic feet per minute for each occupant with normal habits of personal sanitation. This quantity is usually sufficient to satisfy the thermal requirements except in warm weather when the air is not cooled artificially. A substantial percentage of this amount may be recirculated when the air is washed in a spray humidifier or dehumidifier. When the air is not cooled in warm weather, a sufficient amount of outside air must be introduced to prevent the temperature and humidity from rising too high. A somewhat higher air supply is needed in smoking rooms, but exact figures are not available at present. The foregoing values are tentative and may be scaled downward in the future with developments in deodorizing apparatus, which would allow for greater recirculation of air in the interest of economy.

In industrial rooms where the primary consideration may be the control of dusts, fumes or gases in the general atmosphere, the amount of outside air to be introduced is that necessary to dilute the polluting elements below the physiologic threshold concentration.

Limitations of Winter Air Conditioning.—There are many fields in which winter air conditioning [9] is of real value in overcoming adverse conditions, but in the average home or office it is doubtful whether it will serve a useful purpose. After all, winter air conditioning for comfort is largely a matter of rational heating supplemented with adequate building insulation. Modern automatic heating systems can fulfil the requirements very well. Mechanical ventilation, humidification and air cleaning require complicated and expensive apparatus, as well as considerable attention and trouble on the part of the owner.

The claims of public utility companies that winter air conditioning improves the health and efficiency of office employees is difficult to explain and could not be substantiated by the experience of the Metropolitan Life Insurance Company.[10] Absenteeism due to illness among 12,000 employees, half working in a conditioned building and the other half in a building not conditioned but otherwise properly heated, failed to show any measurable difference between the two groups.

The advantage of air conditioning is that the system lends itself easily to summer cooling and dehumidification by the addition of suitable apparatus, or by circulation of cool night air through the building. By the use of proper filters much of the pollen can be filtered out of the air during the pollen season. Street noise may be partially shut off, as the windows can be kept closed.

Residential winter air conditioning systems installed at a price to compete with modern heating systems are inferior to the latter and seldom give satisfaction. Unless a good system is installed, there is nothing to gain and much to lose.

SUMMER AIR CONDITIONING

The Problem of Summer Cooling.—If we try to reproduce the comfortable winter air conditions on a warm summer day, we should find them uncomfortably cold. This is because we become adapted to higher temperatures and at the same time we wear fewer and lighter clothes. As a result of these physical and physiologic changes, the comfortable temperature in warm weather may be from 10 to 20 degrees F. higher than in cold weather.

Cooling for comfort in warm weather is an intricate physiologic problem, much more involved than heating in winter. The difficulty is due in part to complex variations in the rate of metabolism and sweating according to a number of variables, and the liability of chilling warm and perspiring body surfaces. An ordinary air condition that is comfortable to persons with dry skin and clothing may prove too cold for those perspiring, as is the case, for instance, with employees and transient patrons in a cooled store or theater on a warm day. Idiosyncrasies vary; some persons like heat, others dislike it very much. The differences appear to be metabolic and circulatory and cannot very well be taken care of by changes in clothing.

In cold winter weather, when the body surfaces are dry, sudden temperature changes of the order of 70 F. or more have little or no effect on healthy persons suitably clothed. Gradually during the autumn and early winter the organism has had an opportunity to become adapted to increasing temperature contrast and is therefore capable of prompt response to chilling emergencies by compensatory changes in metabolism and blood circulation. Clothing further mitigates the effects of exposure.

Adaptation to summer heat, on the other hand, renders the organism sensitive to much smaller temperature changes especially when the body surfaces are covered with perspiration. Not only may the physical loss of heat by evaporation be very great, but a person may not be successful in quickly increasing heat production in response to sudden chilling, owing to a depressive action of external heat on the heat-producing organs of the body.

The experimental animals of Ogle and Mills,[11] after having been adapted for a few weeks to summer heat, were able to endure safely degrees of excessive heat that in a few hours prostrated and killed those adapted to cooler conditions. But when subjected to sudden chilling, they could not quickly increase their heat production and so suffered a fall in body temperature and were prostrated. Their resistance to infection was considerably affected. On the other hand, animals shifted daily from heat to cold were remarkably resistant to sudden chills but they could not stand rises in temperature beyond that to which they were adapted.

Data on human subjects are scarce, but relevant work by Stuart Mudd and Grant, Winslow and Greenburg, and Gafafer, and some unfinished data shown further on in this present report are particularly suggestive.

Mudd and his co-workers [12] studied the vasomotor reactions of human subjects to chilling and drafts. Their experiments were carried out in midsummer and some ten cases of cold and sore throat developed among the six men serving as subjects. In a number of instances the clinical symptoms were accompanied by interesting bacterial changes. One of the affected subjects was chilled again the following winter with no after-effects.

In similar experiments carried out by Winslow and Greenburg [13] during the cold season of the year, only one of seven subjects developed a cold during the course of the experiments despite the rigorous chilling.

Gafafer's [14] extensive study of weather changes in relation to upper respiratory diseases likewise strongly suggests that changes in weather during the warm

9. Including air filtration, temperature and humidity control, and mechanical air circulation.

10. McConnell, W. J.: Investigations of the Health Aspects of Air Conditioning, Refrigerating Engineering **31**: 79 (Feb.) 1936.

11. Ogle, Cordelia, and Mills, C. A.: Animal Adaptation to Environmental Temperature Conditions, Am. J. Physiol. **103**: 606 (March) 1933.

12. Mudd, Stuart; Grant, S. B., and Goldman, Alfred: The Etiology of Acute Inflammations of the Nose, Pharynx and Tonsils, Ann. Otol. Rhin. & Laryng. **30**: 1 (March) 1921.

13. Winslow, C.-E. A., and Greenburg, Leonard: Vasomotor Reactions to Localized Drafts, Am. J. Hyg. **15**: 1 (Jan.) 1932.

14. Gafafer, W. M.: Upper Respiratory Disease (Common Cold) and the Weather, Baltimore 1928-1930, Am. J. Hyg. **13**: 771 (May) 1931.

seasons are more associated with the incidence of the common cold than changes in weather during a cold season.

The highest respiratory incidence and mortality is seen in hot trades, steel mills, deep mines and the like,[15] and the hazard is not due to heat per se but largely to the imprudent habit of the workers in passing suddenly from an overheated atmosphere to cold air.

Air Conditions in Cooled Buildings.—There is much to be learned about cooling systems for comfort and about optimal air conditions in cooled buildings. The conditions to be maintained depend to a large extent on the climate, the prevailing outdoor temperature and the length of time the occupants remain in the cooled space. Temperature contrasts must not be great. Health, sex, clothing and idiosyncrasies are also important factors to be taken into consideration.

As a rule, little difficulty is experienced in cooled homes and offices when the occupants remain indoors most of the day and so escape, to a large extent, sudden temperature contrasts. Moreover, the amount of cooling can be controlled according to the needs of the occupants, as there are usually few persons in a room.

Laboratory experiments[16] with conventional cooling apparatus place the summer comfort zone at temperatures between 72 and 82 F. with relative humidities between 45 and 60 per cent for exposures of two hours or more.

Studies in cooled homes and offices, including the Metropolitan Life Building in New York, indicate desirable temperatures between 75 and 80 F. with a relative humidity of from 40 to 55 per cent. The criterion in all these studies was the comfort of the majority, so that the air conditions, although satisfactory from the standpoint of comfort, may not necessarily be the best.

In theaters and restaurants, where the occupants remain an hour or two before going out to warm air again, current practice follows a sliding temperature scale from 2 to 15 degrees F. below the prevailing outdoor temperature. When the mean outdoor temperature is 70 F. over a period of hours, the indoor temperature is adjusted to 72 and the humidity approximately at 60 per cent; with a prevailing outdoor temperature of 95 F., the temperature indoors is kept at 80 and the humidity at about 45 per cent.

Unsatisfactory experience with this schedule has resulted in much discussion and criticism, but so far no substitute has been found acceptable to the industry. On entering a building cooled to 80 F. in 95 degree weather, one generally experiences a feeling of chilliness. After an hour or two in such an environment the majority would be comfortable, a few would still shiver, and a few may feel a little too warm. On coming out to the warm outside atmosphere, the majority experience no serious discomfort, a few may momentarily feel dizzy and depressed, and others may be glad to get out.

Complaints are often greatly aggravated by overcooling which results from faulty control equipment or operation, sometimes being done deliberately by overzealous operators for advertising their system. For instance, it is reported with pride by the management of a recently conditioned department store that the temperature in their fur department was lowered to 60 F. last summer; although employees shivered, sales soared, to the great satisfaction of the owners.

15. Yaglou, C. P.: Abnormal Air Conditions in Industry: Their Effects on Workers and Methods of Control, J. Indust. Hyg. & Toxicol. **19**: 12 (Jan.) 1937.
16. Yaglou, C. P., and Drinker, Philip: The Summer Comfort Zone: Climate and Clothing, J. Indust. Hyg. **10**: 350 (Dec.) 1928.

It is perfectly natural for inhabitants of a stimulating climate, like ours, to run to excesses of this kind. All through winter, spring and autumn we have been accustomed to frequent climatic stimulation leading to a vigorous and restless life. A few warm days in the summer depress us severely and we long for the opposite extreme, eager to grasp the opportunity whenever we can.

Disturbances of Heat Loss on Exposure to Great Temperature Contrasts.—The unsatisfactory experience in cooled theaters, stores and railway cars in warm weather would seem to be largely due to the unusually rapid development of the art along purely engineering lines without a requisite preinvestigation of the physiologic requirements of the human body in warm weather.

In a preliminary series of experiments, two young men were selected who seldom complained of cold and two women who always complained when the temperature was lowered below 85 F. in warm weather. After initial exposures of one hour or more to a conditioned room kept at 95 F. and 40 per cent relative humidity,

TABLE 1.—*Disturbances of Heat Loss on Exposure to Great Temperature Contrasts*

	Hot Room, 95 F., 40% R. H.	Cold Room, 80 F., 45% R. H.		Hot Room, 95 F., 40% R. H.	
	After 2 Hrs.' Exposure	On Entering	After 2 Hrs.	On Entering	After 1 Hr.
Average Heat Loss of Two Cold-Resistant Men, in Calories per Hour					
Radiation and convection	20	57*	56	20*	..
Evaporation	70†	70	32†	32	..
Total heat loss	90‡	127	88‡	52	95‡
	Too warm	Too cold	Comfortable	Too warm	Too warm
Average Heat Loss of Two Cold-Intolerant Women					
Radiation and convection	14	44	50	16	..
Evaporation	46	46	19	19	..
Total heat loss	60	90	69	35	56
	Warm	Too cold	Cold	Comfortable	Warm

* Estimated from two-hour exposure.
† Determined from loss of body weight.
‡ Determined by oxygen consumption.

the subjects passed to a cooler room kept at 80 and 45 per cent relative humidity and remained there two hours for observation. At the end of this period the subjects went back to the hot room again for about an hour. The foregoing sets of air conditions are those frequently used in the design of cooling systems for theaters, restaurants and railway cars.

In the hot room the skin was flushed and the major part of the heat loss was by evaporation of perspiration, as shown in table 1, column 1. When the cold room was entered, the heat loss by radiation and convection suddenly increased owing to the lower temperature, while the heat loss by evaporation continued for a few minutes at least at the previous rate in the hot room because of the perspiration in the skin and clothes. The total heat loss was thus suddenly increased to a high rate (column 2) with no immediate compensatory change in the metabolic rate during the first few minutes. This seems to be the explanation for the transitory sensation of chilliness, popularly referred to as "cold shock."

After an hour or so the two men subjects succeeded in adapting themselves to the relatively cold atmosphere, one with a decrease in the metabolic rate (initial rate 98 calories per hour) and the other with a slight increase (initial rate 81 calories per hour). The women were not as successful and remained cold throughout the two hour period. Their initial metabolic rate was low (56

and 63 calories per hour) and apparently did not increase enough to keep them warm.

When the subjects returned to the hot room there was again a disturbance of heat loss, the reverse of that seen on entering the cold room from the hot one (table 1, column 4). Heat loss by radiation and convection immediately decreased, but the loss by evaporation continued for some minutes at the previous low rate in the cold room, until sweating broke out. The result was a transitory depression of heat loss with no compensatory depression of heat production, which explains the oppressive feeling of warmth. The women felt quite comfortable on returning to the hot room, presumably because they were cold before the change.

It is not possible to say at this time just what would be the effect of such sudden changes in temperature on the health of persons if made frequently when the body is warm and perspiring. So far as the two women subjects are concerned, the effect is certainly not beneficial.

The disturbances of heat loss can be moderated to a large extent by providing air conditions that are more consistent with the manner in which the body loses heat in warm weather. In table 2 are shown reactions of the same subjects to a temperature of 88 F. with 27 per cent [17] relative humidity as contrasted with a temperature of 80 with 45 per cent relative humidity in table 1. Not only were the contrasts moderated when the subjects entered and left the dry and warm room, but all four subjects were capable of adjusting themselves satisfactorily to this air condition without experiencing untoward symptoms in the transitional period of readjustment.

TABLE 2.—*Changes of Heat Loss on Exposure to Moderate Temperature Contrasts and Dry Air*

	Hot Room, 95 F., 40% R. H. After 2 Hrs.' Exposure	Cool and Dry Room, 88 F., 27% R. H.*		Hot Room, 95 F., 40% R. H.	
		On Entering	After 2 Hrs.	On Entering	After 1 Hr.
Average Heat Loss of Two Cold-Resistant Men, in Calories per Hour					
Radiation and convection	19	32	30	18	..
Evaporation	69	69	52	52	..
Total heat loss	88	101	82	70	89
Too warm		Cool	Comf. warm	Warm	Too warm
Average Heat Loss of Two Cold-Intolerant Women					
Radiation and convection	15	30	28	14	..
Evaporation	48	48	31	31	..
Total heat loss	63	78	59	45	54
Comfortably warm		Cool	Comfortable	Warm	Comfortable

* This was the lowest humidity that was possible to obtain by means of a conventional spray dehumidifier.

No sweeping conclusions can be drawn from these limited physiologic data, but the observations must be amplified and repeated on a large group of persons to determine what is the best compromise under all summer weather conditions. Although a number of persons were found who prefer somewhat lower temperatures for comfort than the majority, the problem in public buildings is to work out a compromise that will satisfy both the "heat intolerant" and the "cold susceptible" throughout their stay in the conditioned space.

Dehumidification of air with but little cooling is especially indicated in tropical climates, as was first suggested by Tyler [18] thirty-five years ago. It may also prove the best method in banks and stores where the customers come and go, spending but a few minutes in the cooled space. The method avoids the extremes of overcooling and yet seems to conform to that important biologic principle of preserving balance between contrasting requirements of individual groups, especially between employees in a store and transient patrons.

In the past few years, dehumidification systems have appeared on the market but have not proved at all popular for summer air conditioning. The concept of cooling by dehumidification of air encountered considerable resistance in the industry, owing largely to the changes from convectional refrigeration apparatus that it implied. Research now in progress may settle the disputed points.

Possibilities and Limitations of Summer Air Conditioning.—Cooling in hot weather unquestionably contributes much to the comfort and efficiency of man and under certain circumstances is an important factor in the course and prognosis of some diseases. The open questions are What are the best methods of cooling our living and working quarters? Can we afford this luxury at present? and When is the cost justified by the results obtained?

The first question can be answered only by research, but this is not a sufficient reason to condemn present methods of cooling altogether. In many public buildings and railway cars, cooling in warm weather is as important as heating in winter. Its commercial value is great. Cooling is more important in the South than in the North, and more important to some persons than to others.

Experience in a number of large office buildings, including the spacious offices of the Metropolitan Life Insurance Company, has been entirely satisfactory from the standpoint of comfort.[19] The employees were able to pursue their daily duties without the depression and discomfort experienced prior to the installation of the system.

Cooling may be a potential necessity for the average home, but for the time being it is still a luxury, owing to high costs. The field is at present limited to expensive residences where cost and service are matters of secondary consideration.

In many parts of the country where the temperature usually drops at night, natural and preventive measures are usually sufficient in affording relief during the heat of the day. This holds particularly in the average home, the uncrowded office or the shop. Adequate insulation, including the use of awnings on the sunny side of the building and the circulation of cool air by means of an exhaust fan in the attic space, will keep the building reasonably comfortable during the daytime. When no such provisions exist, the use of an ordinary desk fan will alleviate discomfort.

When cooling is desired in an ordinary home, it may be sufficient in the interest of economy to cool one or two rooms in the day time by the use of a unit room cooler. The bedrooms can be cooled at night by the circulation of cool night air. Where ice can be had conveniently at a low price it is more economical to use than mechanical refrigeration, as the period of cooling in the North is only twenty to thirty days every year.

55 Shattuck Street.

17. A relative humidity of 27 per cent was the lowest that was possible to obtain with a conventional spray dehumidifier.

18. Tyler, W. F.: Some Psychophysics of Climate, J. State Med., London **42**: 98 (Feb.) 1934.

19. McConnell, W. J., and Kagey, I. B.: The Air Conditioning System of the New Metropolitan Building: First Summer's Experience, Tr. Am. Soc. Heating and Ventilating Engineers **40**: 217, 1934.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

HOWARD A. CARTER, Secretary.

BARR SW-15 SHORT WAVE RADIOTHERMY AND ELECTRO SURGICAL UNIT ACCEPTABLE

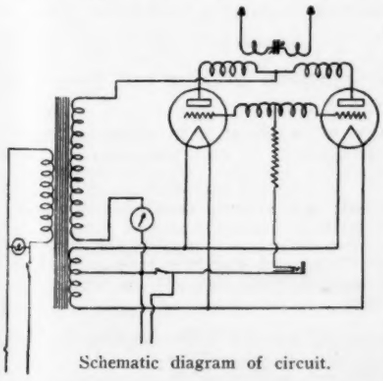
Manufacturer: Barr Laboratories, Inc., New York City.

The Barr SW-15 Short Wave Radiothermy unit is recommended for medical and surgical uses. This machine is an oscillating short wave generator employing two tubes. The wavelength is approximately 15 meters. It has a single knob control for both therapeutic and electrosurgical currents with only one set of outlets in the patient circuit. The electrosurgical current for tissue cutting, coagulating and desiccating are monopolar.

Barr SW-15 Short Wave Radiothermy and Electro Surgical Unit.

The input wattage on this machine is approximately 875 watts on 105-125 volts, 60 cycle, alternating current line. The power output of the SW-15 was measured as 395 watts. The means employed for obtaining this value was to couple a 500 watt incandescent bulb to a standard set of large applicators. The luminosity of the bulb was then checked by a calibrating photo-electric cell. As a conservative statement only 375 watts is claimed by the firm. It is pointed out, however, that no acceptable method of determining the output of a short wave diathermy unit has been developed.

Standard equipment of this unit consists of one pair of rubber molded applicators 5 by 7 inches, one pair 3½ by 4½ inches, one foot switch, one chuck handle and three tips for cutting, coagulating and desiccating. Cuff electrodes are included as part of the regular equipment. Its shipping weight is 125 pounds.



Schematic diagram of circuit.

As is customary, the firm submitted evidence to substantiate the claims of the temperature elevating influence of the SW-15 machine on the living human thigh. A reliable investigator was appointed by the firm to perform these tests. He carried out eight tests, using the cuff technic. Four normal male subjects were used, with an average thigh circumference of 49 cm. Cuffs measuring 48 by 3.6 cm. were wrapped about the thigh, 20 cm. apart from edge to edge, over two thicknesses of toweling.

Average of Eight Observations, Cuff Electrodes

Deep Muscle		Subcutaneous		Rectal		Skin	
Initial	Final	Initial	Final	Initial	Final	Initial	Final
97.7	105.5	92.2	102.2	98.6	98.9	87.4	92.5

The temperature measurements were taken by thermocouples before and after twenty minute treatments. The thermocouples were inserted into the subcutaneous and intramuscular tissue in the usual manner. Skin temperatures were also taken by thermocouple readings. Rectal temperatures were observed. The room temperature varied from 68 to 70 F. The humidity ranged from 40 to 50 per cent. Eight observations were made, two on each subject, first on the left and then on the right thigh.

Each reading in the table is an average of eight observations.

The transformer temperature rise taken over a two hour period with the machine running at full load was found to be within the limits of safety prescribed by the Council. Burns may be produced but can be avoided by taking ordinary precautions.

This unit was investigated with the cuff technic, in a clinic acceptable to the Council, and found to be satisfactory.

In view of the foregoing report from the Council's investigator, using cuff technic, the Council voted to include the Barr SW-15 Short Wave Radiothermy unit in its list of accepted devices.

HEALTH RAY TWIN CARBON ARC SUN LAMP NOT ACCEPTABLE

Manufacturer: Health Ray Manufacturing Company, Inc., New York.

From time to time the Council is called on for information on ultraviolet generators; for example, carbon arc and mercury arc lamps, sold to the public for irradiating the body without the supervision of a physician.

Aside from differences in total ultraviolet output, the chief distinction between therapeutic ultraviolet generators for use by physicians and so-called sun lamps for unsupervised home use is that, in order to be acceptable to the Council, the latter shall not emit an appreciable amount of ultraviolet radiation of wavelengths shorter than 2,800 angstroms.

In a previous communication [1] the single arc, carbon electrode, Health Ray Sun Lamp was found unacceptable by the Council because it is not provided with a Corex-D glass window to exclude the ultraviolet of wavelengths shorter than 2,800 angstroms. But, even if it were provided with such a window, it could not be accepted because the intensity is below the minimum requirements of the Council.

The Health Ray, Twin Arc, Sun Lamp (Model 35) consists of two arcs, between two pairs of carbon electrodes, confined in a metal housing 12 by 7 by 5½ inches in outside dimensions, with openings in the sides and top for ventilation.

The front side of the housing has an opening 6 inches in diameter, covered with a small mesh wire screen, through which the arc radiation emanates. This opening could be covered, easily and cheaply, with a Corex-D window, to conform with the Council's requirements limiting the spectrum at 2,800 angstroms.

The rear side of the box consists of a hinged door, on the inside of which is mounted a porcelain insulating base that supports the two pairs of carbon electrodes, and the ballast resistance.

The arc is formed by rotating a knob on the outside of the door and, once formed, it continues to burn for about four minutes. If the arc is not adjusted, the exposure is limited to about four minutes, which is commendable in a home model lamp.

Radiometric Tests.—Following the recommended procedure, by means of a differential thermopile and filter radiometer, measurements of the ultraviolet radiant flux, of wavelengths shorter than and including 3,132 angstroms, were made in a laboratory acceptable to the Council.

As received from the manufacturer, the lamp is provided with "supertan" (sun tan) carbon electrodes, 8 mm. in diameter, and when operated as directed, the current used was about 9 amperes (110 volts, alternating current) at the start, decreasing to about 6.5 amperes when the arc burned out. The arc burned quietest on 8.0 to 8.5 amperes, requiring a total power input of from 800 to 850 watts.

At a distance of 24 inches from the front face of the lamp housing the ultraviolet radiant flux (intensity), of wavelengths shorter than and including 3,132 angstroms, with only the wire mesh in front of the arc, ranged from 99 to 114 microwatts per square centimeter ($\mu W/cm.^2$), or an average of about 110 $\mu W/cm.^2$ during a run of four minutes. This intensity is about twice the minimum value (55 $\mu W/cm.^2$) required by the Council for acceptance as a therapeutic lamp using polymetal (Therapeutic C) electrodes and hence is acceptable to the Council for use as a therapeutic lamp.

In a biologic (erythematogenic) test a series of exposures of the untanned inside upper arm was made at a distance of

1. Health Ray Sun Lamp Not Acceptable, J. A. M. A. **107**: 498 (Aug. 15) 1936.

20 inches from the front of the housing of the arc. A minimum perceptible erythema (one that disappears within twenty-four hours) was produced in about five minutes. The action of the lamp is therefore too rapid in inexperienced hands.

Radiometric measurements were made also on this Twin Arc Lamp (using "supertan" electrodes) when covered with a window of Corex-D glass, which excluded radiation of wavelengths shorter than 2,800 angstroms. The total ultraviolet output, of wavelengths shorter than and including 3,132 angstroms, ranged from 20 to 22 μW/cm.^{2}, or from 24 to 27 μW/cm.^{2} if the wire screen had been removed. This is about twice the minimum value required by the Council for acceptance of such a lamp for home use.

Since the type of housing has little or no effect on the ultraviolet output, which is controlled principally by the kind and size of the electrode and the electric current through the arc, the foregoing measurements should apply to the various twin arc lamps, using "supertan" electrodes 8 mm. in diameter, taking from 8 to 9 amperes, now appearing on the market under various trade names.

If manufacturers of twin carbon arc sun lamps for home use would provide the housings of such lamps with windows of Corex-D glass to intercept radiation of wavelengths shorter than 2,800 angstroms, the Council could include them in its list of accepted devices.

The Council voted not to include the Health Ray Twin Carbon Arc as a sunlamp for home use in its list of accepted devices, because (1) when the lamp is used without the Corex D window the ultraviolet of the wavelengths shorter than 2,800 angstroms is greatly in excess of the value acceptable to the Council for sunlamps for home use and (2) because the lamp is recommended for use without the supervision of a physician.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

PAUL NICHOLAS LEECH, Secretary.

THIAMIN CHLORIDE

The pure form of vitamin B_1 has recently become commercially available in the form of a crystalline hydrochloride. As the product has been submitted to the Council this necessitated the coining of an acceptable nonproprietary name. Dr. Jansen of Amsterdam coined the name Aneurin. The Council recognizes the right of the discoverers to coin names for their products, but it cannot accept those names if they are therapeutically suggestive. Dr. Jansen has been very cooperative in discussing the matter of nomenclature for vitamin B_1 and suggested certain other names. Dr. Jansen suggested that Dr. R. R. Williams, who recently accomplished the synthesis of vitamin B_1 crystals, propose a name based on the chemical structure. Dr. Williams informally proposed the term Thiamin Chloride.

A communication was sent to Dr. Jansen by the Council office (March 30) as follows:

". . . Out of these discussions came the possibility that the name Thiamin Chloride would be an acceptable type. The Council discussed formally the proposed name, Thiamin Chloride, at its meeting of March 12 and 13, and it formally approved of this name, tentatively awaiting, of course, final approval by you. In the meantime, the name will also be proposed at the meeting of the American Society of Biochemists.

"Upon investigation in this country, we find that the name Thiamin Chloride is not trademarked. It is indicative of the chemical composition, and easily pronounced.

"This office shall be indeed grateful for your consideration of this name, and your frank comment. The Council wishes to cooperate with you to the fullest extent on this matter, and will take no final action until it has had an opportunity to consider your reply."

To this Dr. Jansen replied (in part) May 1:

"Many thanks for your letter of March 30, 1937. As I told you in my first letter, I do not insist on the name 'aneurin,' and so I have no objection against the name Thiamin Chloride, on the sole condition that it is adopted internationally. Otherwise I fear it will augment the confusion. Now in Europe the name aneurin finds more and more acceptance; so e. g. it is now adopted in the 'Abderhalden's Handbuch der biologischen Arbeitsmethoden.'"

In the meantime, the American Society of Biological Chemists, the American Institute of Nutrition and the Committee on Nomenclature of the American Chemical Society have all tentatively approved the term Thiamin Chloride suggested by Dr. Williams. Dr. Jansen also suggested that the matter be referred to the International Committee on Nomenclature. The Council feels however that the delay which would be involved, amounting to many months, makes this provision difficult to accept in toto. Since manufacturers have already asked for the acceptance of the product under a nonproprietary name, a delay would seriously endanger the project of introducing an acceptable nonproprietary name into the literature. The Council desires to express to Dr. Jansen its deep gratitude for his cooperation in this matter and wishes to comply as far as possible with the spirit of Dr. Jansen's suggestions for consideration by an International Committee on Nomenclature. The Council therefore decided to adopt the name Thiamin Chloride as a common name for Vitamin B_1 Hydrochloride with the proviso that if the International Committee in 1938 should adopt some other suitable name the Council will feel free to concur in the use of the international name, with Thiamin Chloride as a synonym. It is understood that if other salts are found suitable they should be named accordingly "Thiamin Sulfate," "Thiamin Bromide," and so on.

AVERTIN WITH AMYLENE HYDRATE: II

Avertin, the trade name of the Winthrop Chemical Company for tribrom ethyl alcohol (designated in the foreign literature also as "ethobrome," "rectanol," "renarcol," "narcotyl," "E 107," "Byck 250") and its dosage form, avertin fluid (now "avertin with amylene hydrate"), were the subjects of a preliminary report by the Council[1] in 1930. The Council decided not to admit avertin and its dosage form to New and Nonofficial Remedies:

"(1) until satisfactory studies of its properties, its advantages and its disadvantages have been made; (2) until the contraindications have been satisfactorily established; (3) until a generally accepted technic whereby it can be used as satisfactorily as ether has been established; (4) until the action of the amylene hydrate in avertin liquid—whether by addition or by potentiation—has been determined and the amount declared; and (5) until the advertising has been revised to omit misleading statements contained in the present advertising and especially to recommend the product only for initiation of narcosis (basis narcosis) and not for complete narcosis."

Among the disadvantages of avertin with amylene hydrate pointed out in the aforementioned report were:

"1. Higher death rate than after ether. 2. Depression of respiratory center. 3. Depression of circulation. 4. Acidosis as actively as after chloroform. 5. Insufficient muscular relaxation in laparotomy (?). 6. Falling back of tongue, making constant observation necessary until the patient is fully conscious. 7. Lack of control from moment to moment (almost unanimous). 8. Want of exact dosage. 9. Narrow zone between anesthetic and fatal dose. 10. Disadvantages inherent in mixed narcosis. 11. Lack of adequate pharmacologic study of avertin and its synergistic action with morphine, ether and other substances. 12. A lack of agreement concerning the indications and contraindications."

In 1932 the Council again considered avertin fluid and again decided not to accept the product, largely because of comments of members of the Council who considered that in the dosages commonly employed avertin with amylene hydrate was not safe. Doubt was expressed as to possible deleterious effects of the amylene hydrate component in the amounts usually administered.

Four years later the Council once more considered the available evidence as to the therapeutic usefulness of avertin with amylene hydrate and concurred in the opinion of the referee that there can be no question that experience with this mixture has established the range of its usefulness and that its indications and limitations are now well known. Up to the middle of 1936, approximately 700 papers had been published on avertin or avertin with amylene hydrate since the introduction of

1. Avertin: Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. **95**: 1427 (Nov. 8) 1930.

tribromethanol; of these nearly 400 were reviewed by Anschütz, Specht and Tiemann[2] in a 200 page monograph published in 1930. The present referee collected about 300 references published subsequently. The number of cases in which avertin with amylene hydrate has been used undoubtedly amounts to many hundred thousands (early in 1935 Desmarest claimed this to be 600,000). Only a portion of these cases has been reported in the literature but this fraction alone appears to be more than adequate for an estimate of the usefulness of this preparation; thus, in fifty papers chosen at random from among those published between 1932 and 1935, approximately 20,000 cases were reported. The overwhelming majority of the reports are favorable.

It is obviously not feasible to review in detail all the available literature; this would require a monograph even more extensive than that of Anschütz and his collaborators. Therefore, in this report only a brief summary of the more pertinent data in available literature will be presented. References will be given only in a few instances; compilation of a complete bibliography as part of this report is obviously not practicable.

Avertin with amylene hydrate is now the only form of tribromethanol marketed. It is a 100 per cent weight/volume solution of tribromethanol (tribrom ethyl alcohol) in amylene hydrate (tertiary amyl alcohol); each cubic centimeter contains 1 Gm. of tribromethanol and 0.5 Gm. of amylene hydrate.

Tribromethanol is relatively unstable; it decomposes slowly on standing and rapidly on heating above 40 C. with the liberation of the irritant hydrobromic acid and dibromacetaldehyde. The firm supplies a vial of congo red indicator with each bottle of avertin with amylene hydrate to detect acidity in each dose of the drug as it is prepared by dilution in warm water. However, congo red has a range of p_H 3 to 5 and thus, as pointed out by several authors, it is useless in detecting any but a high acidity. Ashworth[3] has therefore suggested the employment of a more suitable indicator, capable of detecting early deterioration of avertin. He proposes a mixture of methyl orange, methyl red, naphtholphthalein and phenolphthalein ("universal indicator" of Martindale's "Extra Pharmacopoeia") having a range of p_H 4 to 11. In order to meet this objection the firm has revised its directions for use of the congo red indicator requiring that the color of the avertin solution to which the indicator has been added should match that of distilled water plus indicator. This enables the detection of smaller quantities of acid. The A. M. A. Chemical Laboratory is studying this question further.

Serious toxic effects noted in the early clinical use of avertin are now recognized as having been due chiefly to the administration of large doses (150, 175 and even 200 mg. of avertin per kilogram of body weight, either as avertin itself or as avertin with amylene hydrate) and to a poor knowledge of the contraindications. It is now recognized that 100 mg. per kilogram as avertin with amylene hydrate is ordinarily a maximum dose, and with this dose untoward effects appear to be uncommon. However, even the 100 mg. dose occasionally produces complete and not basal anesthesia and accompanying circulatory and respiratory depression. A number of anesthetists have obtained excellent results with smaller doses, namely from 60 to 80 mg. of avertin per kilogram (30 to 40 mg. of amylene hydrate per kilogram) with a consequent further reduction of deleterious effects. The Council believes that a dose of 80 mg. per kilogram should be established as the ordinary maximum; in perhaps the majority of cases less will be sufficient. With this maximum dosage and with proper attention to the contraindications, avertin with amylene hydrate appears to be quite safe for basal anesthesia. In young vigorous subjects, however, from 90 to 100 mg. per kilogram may in some cases be employed with safety. The total amount of avertin with amylene hydrate should not exceed from 6 to 8 cc. for women or from 9 to 10 cc. for men, regardless of weight.

The contraindications (relative or absolute depending on the condition of the patient) include liver or kidney dysfunction, severe cardiac disease, old age, shock or dehydration, sepsis, toxemia, severe pulmonary tuberculosis, empyema, marked hypothyroidism, obesity, asthenia, cachexia, ileus, tumors of the colon, enteritis and acidosis.

Sir Francis Shipway,[4] in presenting his experience with 1,600 administrations of avertin with amylene hydrate, discusses contraindications as follows:

"Provided the dose be suitably adjusted, the contraindications are exceedingly few. This statement, however, needs qualification. It should apply only to the anaesthetist who has had not only considerable experience in anaesthesia, but in avertin anaesthesia. *The practitioner who is called upon to administer anaesthetics on few and irregular occasions, or is but a beginner in this arduous and hazardous specialty, will be well advised to leave avertin severely alone* [emphasis the referee's]. The chief danger lies in depression of the respiratory centre; the blood pressure is also lowered. It is better, therefore, if there is any doubt in the mind of the anaesthetist, to withhold it in the case of advanced pulmonary tuberculosis, where the respiratory exchange is poor, in acute empyema, or states of drowsiness whether caused by drug or toxaemia. Extreme thyroid deficiency or a condition of very low blood pressure due to shock, haemorrhage, sepsis or cachexia would also, speaking generally, render the patient unsuitable for avertin in inexperienced hands. Colitis and intestinal obstruction should also be looked upon as contraindications. Cyanosis due to congenital heart disease or chronic valvular disease does not forbid its employment, although it does, of course, prescribe a smaller dose than the average. Deepening of cyanosis, after absorption has occurred, should be countered by a plentiful supply of oxygen and the maintenance of a free airway. It is true that coramine, ephedrine and carbon dioxide are efficient antidotes to excessive dosage of avertin, if given in time and with judgment. Washing out of the rectum on the first sign of overdose, such as slow shallow respiration and slow feeble pulse, is also a measure not to be despised. I have noticed that on those occasions on which the solution has been returned even as late as half an hour after injection, or on which it has been deliberately syphoned off—for example, before the performance of a plastic operation on the perineum—there has been a definite diminution in the depth of the narcosis. In one case of extreme overdose (10 times) reported to me . . . washing out the rectum was effective, and the operation was completed without mishap or complication."

Studies on absorption and elimination have been concerned chiefly with the avertin component of avertin with amylene hydrate. When administered in a 3 per cent solution, 50 per cent of the avertin is said to be absorbed from the colon in ten minutes, 75 per cent in twenty minutes, 85 per cent in twenty-five minutes and from 90 to 95 per cent in two hours. Narcosis is said to occur with a concentration of avertin in the blood of from 6 to 10 mg. per hundred cubic centimeters and awakening to occur when it falls to 2 or 3 mg. per hundred cubic centimeters. Tribromethanol is detoxified by conjugation with glycuronic acid (largely and perhaps entirely in the liver) and the glycuronate is excreted by the kidneys, from 70 to 80 per cent in forty-eight hours, from 90 to 95 per cent in seven days. Amylene hydrate is in part excreted (unchanged?) by the kidneys, in part eliminated in the expired air.

Objection has been made to the use of avertin fluid because of possible danger of the amylene hydrate component in the dosage used. While some authors have claimed that this substance does not partake in the narcotic effect, this is manifestly absurd. It has been claimed that the amylene hydrate tends to slow absorption through its solution affinity for tribromethanol, but the observations on which this claim is based were made with the 100 per cent solution administered to rats. While this delay might occur from the 100 per cent solution, it is quite unlikely to occur from the 2.5 or 3 per cent dilution used clinically. In fact, with this dilution no such delay has been observed in patients. It appears, nevertheless, that the danger of the amylene hydrate component has been much exaggerated. The maximal single hypnotic dose for man is ordinarily stated to be 4 Gm. For a 70 Kg. man, a dose of 100 mg. of avertin per kilogram (as avertin with amylene hydrate) would represent 70 × 50 mg. of amylene hydrate, or 3.5 Gm. With the smaller doses recommended as the ordinary maximum in this report (80 mg. per kilogram) a maximum dose of 2.8 Gm. of amylene hydrate would be administered to a 70 Kg. man. This may seem excessive when added to a narcotic dose of avertin. However, investigation of the literature reveals relatively few cases of intoxication from amylene hydrate. Kochmann[5] states (translated), "noteworthy is the small number of fatal poisonings." He cites only one fatality; this followed a dose of from 28 to 29 Gm. by rectum. Two other cases are cited repeatedly in the literature; apparently they have become classic: One patient, a 73 year old man, received

2. Anschütz, W.; Specht, K., and Tiemann, F.: Die Avertinnarkose in der Chirurgie, Ergebn. Chir. u. Orthopäd. **23**: 406-605, 1930. Also published as a monograph by Julius Springer, Berlin.
3. Ashworth, H. K.: Sensitive Test for Purity of Avertin Solution, Brit. M. J. **2**: 489 (Sept. 9) 1933.
4. Shipway, Sir Francis: Avertin: An Analysis of 1,600 Administrations, Brit. J. Anaesth. **12**: 150 (July) 1935.
5. Kochmann, M.: Schlaffmittel: Gruppe des Amylenhydrats, Urethan und Paralydehyd, Handb. exper. Pharmakol. **1**: 426, 1923.

18 Gm. of amylene hydrate and recovered after a thirty hour period of unconsciousness. The other patient received 27 Gm. but recovered after several days. The minimal fatal dose for man is impossible to estimate from data available in the literature, but it must be several times the maximum hypnotic dose. Kochmann gives the minimum lethal dose for rabbit or dog as 1.5 Gm. per kilogram and for the cat as 1 Gm. per kilogram. Harnack and Meyer [6] state the minimum lethal dose to be 2 Gm. per kilogram for the dog and from 1 to 1.5 Gm. per kilogram for the rabbit or cat.

Amylene hydrate in doses of from 3 to 5 Gm. in man is said to produce little change in the circulation and to cause acceleration and increased depth of respiration. With larger doses, depression of both occurs. Tolerance to amylene hydrate is readily acquired; this may also occur with repeated administrations of avertin with amylene hydrate (Maddox, cited by Shipway).

It appears that amylene hydrate contributes a more prolonged action to the avertin mixture than that possessed by the somewhat more evanescent avertin alone. Amylene hydrate also adds to the side effects; these include a fall in temperature, often of several degrees, and proper care is required to combat it clinically.

With proper dosage of avertin with amylene hydrate and care of the patient, significant depression of circulation and respiration are said not commonly to occur. With larger doses, and occasionally with smaller doses, marked respiratory and/or circulatory depression does take place. Carbon dioxide, ephedrine, caffeine with sodium benzoate, among other drugs, are said to be effective antidotes. Thyroxine, if administered sufficiently in advance to increase the metabolic rate, is claimed to hasten the elimination of avertin but, except with respect to the use of avertin with amylene hydrate in cases of hyperthyroidism, in which large doses appear to be well tolerated, this observation probably has little practical significance.

While large doses of avertin with amylene hydrate administered repeatedly to animals cause moderate but reversible liver damage, in the clinical use of the preparation no functional hepatic deficiency appears to occur, as determined by the bromsulfalein test.

Acute renal insufficiency appears to be an absolute contraindication to the use of avertin with amylene hydrate, although it has been used with claimed safety in chronic low grade renal insufficiency.

Arnheim and Tuchman [7] have reported a detailed study on fifteen patients; these included ten males and five females who were admitted to surgery for comparatively minor operations (chiefly inguinal herniorrhaphies) but were otherwise in good health. These patients received 100 mg. of avertin per kilogram (as avertin with amylene hydrate); studies were made immediately before administration and one and four hours after administration of the drug. Pulse rate, arterial and venous blood pressure, respiratory rate and amplitude, temperature, basal metabolic rate, blood chemistry, blood histology, blood clotting time and urinary examinations were recorded. Operations were not performed until the studies were completed; little additional anesthesia was found necessary (this is further evidence that the 100 mg. dose is excessive, as a relatively strong effect persisted for more than four hours). Following is a summary of the observations: Average increase in pulse rate of 16 per minute and of respiratory rate of 6 per minute; amplitude of respiration was decreased. Average decrease in systolic blood pressure of 24 mm. of mercury; average decrease in rectal temperature of 1.3 degrees F. (0.7 degree C.); average decrease in basal metabolic rate of 22 per cent; average decrease in blood clotting time of three minutes. There were slight early rise in blood sugar, slight fall in blood carbon dioxide, slight rise in blood plasma volume, negligible or no change in venous pressure, blood cholesterol and esters, blood calcium, chlorides and formed blood elements. There were slight oliguria and increase in specific gravity of the urine. Conjunctival and tendon reflexes were lost, but cutaneous and pharyngeal reflexes were retained. Slight cyanosis occurred in two cases; increase in secretion of mucus was noted in five and slight vomiting in three cases. No residual untoward effects were detected.

The foregoing study agrees in general with more extensive experimental and clinical reports in the literature, notably by Bourne and his associates, Sebening, Desmarest, Anschütz, Lendel, Barlow, Goldschmidt, Field and Pilcher and many others.

Bourne has observed a moderate acidosis after avertin with amylene hydrate associated with an increased excretion of phosphates. He therefore administers an alkaline phosphate mixture by rectum as a routine following each operation in which this drug is used.

Avertin with amylene hydrate has been found by a number of authors (Berman, Boyce and McFetridge, Cole, Fawcett, Harrison and Higgins, Mitchell, Simons and others) to be of value as an adjunct to the use of tetanus antitoxin in the treatment of tetanus; repeated doses are administered, sufficient to interrupt the convulsive seizure and to keep the patient quiet over a period of several days if necessary.

The necessity for special nursing care of patients who receive avertin with amylene hydrate has been mentioned in many reports. This is emphasized by a number of authors and has been well stated by Field and Pilcher: [8]

> "The longer duration of unconsciousness and irregular as well as increased restlessness after avertin meant that it was necessary to give avertin patients special postoperative care for a much longer period than with other anesthetics. The patient was undoubtedly much more comfortable—especially since the events of the first few hours after operation were usually entirely forgotten—but the nursing problem of the hospital was greatly increased. The patients appeared just as irresponsible during the prolonged drowsy, restless period of awakening from avertin as during the shorter excitement stage following ether. . . . Several patients who had had avertin anesthesia complained a few hours after operation of a severe headache lasting twenty-four to seventy-two hours. This headache in many instances seemed much more distressing and persistent than the usual type of postoperative headaches. . . ."

Field and Pilcher report one case of bromide rash following the administration of avertin with amylene hydrate.

While avertin with amylene hydrate appears to be useful in practically all fields of surgery (provided dosage limitations and contraindications are rigidly observed) there is considerable disagreement as to its value in obstetrics, in which it is used for analgesia in dosage below that usually necessary for basal anesthesia. It is said by some to delay labor, to make the patient unmanageable and often to depress the fetus. Others who have developed a special technic for its use claim good results. Dodek [9] found that in the dosage commonly employed in obstetrics (60 mg. per kilogram) avertin with amylene hydrate prolongs intervals between contractions, that analgesia does not last long enough to warrant the special care these patients require, and that many patients become unmanageable when the effect begins to wear off.

The question of the number of fatalities from avertin with amylene hydrate is a difficult one to estimate with any degree of accuracy because, as has been pointed out repeatedly, the majority of fatalities are not reported and in those that are the rôle played by the avertin preparation in the ensuing death is often impossible to determine. Recent reports of several series of cases ranging in size from about 400 to more than 3,000 each indicate that the estimate of one death in 10,000 cited by the Council's referee from the German literature in 1932 is probably accurate. This, however, like all such figures, is impossible either to confirm or to refute for the reasons stated.

The deaths due to avertin or to avertin with amylene hydrate that have been reported belong almost without exception in one or more of the following categories: (1) patients in whom crystalline avertin alone or avertin with amylene hydrate was used in excessive doses; (2) patients who would now be recognized as having definite contraindications to avertin with amylene hydrate; (3) patients who received previous medication with morphine (with or without atropine or scopolamine) followed by a large dose of avertin with amylene hydrate; (4)

6. Harnack, Erich, and Meyer, Herrmann: Das Amylenhydrat: Eine pharmakologische Studie, Ztschr. f. klin. Med. **24**: 374, 1894.

7. Arnheim, E. E., and Tuchman, L. R.: Avertin (Tribromethanol) Anesthesia in Normal Persons, Arch. Surg. **29**: 1 (July) 1934.

8. Field, W. H., and Pilcher, L. S., Jr.: Avertin Anesthesia: A Study of 431 Cases Compared with 431 Similar Cases Operated on Under Other Types of Anesthesia, at the Brooklyn Hospital, Ann. Surg. **97**: 577 (April) 1933.

9. Dodek, Samuel: New Method for Graphically Recording Contractions of Parturient Human Uterus: Study of Effect of Certain Sedatives, Anaesthetics and Stimulants upon Uterus in Labor, Surg., Gynec. & Obst. **55**: 45 (July) 1932.

patients who failed to receive adequate postoperative nursing care (maintenance of open airway, and so on).

Shipway[4] warns that the preliminary use of morphine or other drugs which depress the respiratory center may carry a considerable hazard:

". . . morphine, although exceedingly useful in the right place, should not be given without the most careful consideration of all the circumstances of the case."

Shipway used morphine in about one third of his 1,600 cases (in which there was no death due to avertin with amylene hydrate). Others use it more frequently. Mueller,[10] in reporting a series of 3,338 cases (without a death which the author considers may be attributed to avertin with amylene hydrate) states:

"Usually a hypodermic of morphine, gr. one-sixth or one-fourth with atropine or scopolamine, is given forty-five minutes before operation."

It is significant that this author reports, "The chief complication which we have had to combat was respiratory depression." She believes that in most cases this was due to failure to maintain an open airway rather than to depression of the respiratory center, but it is obvious from the subsequent discussion that stimulants were required in many cases.

Boyd[11] reported 700 cases in which avertin with amylene hydrate was used as a complete anesthetic in children in doses of 175 and even 200 mg. per kilogram (children are known to tolerate relatively high doses of this mixture). He administered preliminary morphine from 1/40 to 1/10 grain and atropine from 1/180 to 1/150 grain, depending on age. Eighteen of these patients required coramine to combat respiratory or circulatory depression. Only two deaths from any cause occurred in this series of 700, one from brain abscess, the other from intestinal obstruction due to tumor. Despite the fact that this author had no fatal accidents directly caused by the anesthetic, apparently because of careful vigilance of the anesthetist and the nursing staff, the Council believes that avertin with amylene hydrate should not be used as a complete anesthetic even in children, owing to the hazards involved in the use of a noninhalation anesthetic in this way.

Bourne and O'Shaughnessy,[12] in reporting 1,000 "avertin anesthesias" (without a death attributed to avertin with amylene hydrate), do not even mention the use of morphine, whether because they do not use it or because they take its use for granted is not clear.

The Winthrop Chemical Company has agreed to market avertin with amylene hydrate for *basal anesthesia only* in accordance with the conditions of the foregoing report. The Council has, therefore, accepted avertin with amylene hydrate for inclusion in New and Nonofficial Remedies. The description appears in the New and Nonofficial Remedy column of this issue.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

AVERTIN WITH AMYLENE HYDRATE.—Tribromethanol in amylene hydrate.—A solution of tribromethanol (tribrom-ethyl-alcohol; CBr_3CH_2OH) in tertiary amyl alcohol [$(CH_3)_2.C(OH).C_2H_5$]. Tribromethanol contains 84.78 per cent bromine. Each cubic centimeter of avertin with amylene hydrate contains 1 Gm. tribromethanol and 0.5 Gm. amylene hydrate.

Actions and Uses.—Avertin with amylene hydrate is used for basal anesthesia by rectal administration. It should not be employed in dosage sufficient to cause complete anesthesia. When employed for basal narcosis the amount of inhalation anesthetic necessary to establish and maintain complete anesthesia is diminished. A prolonged period of sleep usually follows termination of inhalation anesthesia; during this after-period careful nursing care and continuous vigilance are necessary to maintain an open airway and to prevent the cyanosis and respiratory failure which sometimes follow. Ephedrine, carbon dioxide and caffeine with sodium benzoate are said to be effective antidotes against respiratory and circulatory depression occurring from avertin with amylene hydrate.

Contraindications to the use of avertin with amylene hydrate (relative or absolute depending on the condition of the patient) include liver or kidney dysfunction, severe cardiac disease, old age, shock or dehydration, sepsis, toxemia, severe pulmonary tuberculosis, empyema, marked hypothyroidism, obesity, asthenia, cachexia, ileus, tumors of the colon, enteritis and acidosis.

Avertin with amylene hydrate is said to be useful in the control of certain convulsive conditions such as tetanus; in the latter condition it is used in repeated doses in conjunction with administration of tetanus antitoxin to control the seizures over a period of several days if necessary.

Caution.—Avertin with amylene hydrate should never be employed by those inexperienced in its use except under expert supervision.

Dosage.—Avertin with amylene hydrate is administered rectally in 2.5 per cent solution in warm distilled water at a temperature not exceeding 40 C. A small quantity of the solution should be tested with the congo red indicator supplied with the preparation just before administration; the color of the solution should match that of an equal amount of distilled water containing an equal quantity of the congo red indicator. If the colors do not match, this indicates the presence of irritant hydrobromic acid and *di*-bromacetaldehyde, and the solution should be discarded.

The ordinary maximum dose for basal anesthesia is 80 mg. of avertin (40 mg. of amylene hydrate) per kilogram of body weight. Often less will be sufficient. In young, vigorous persons the dose may sometimes be increased to 90 or 100 mg. of avertin (from 45 to 50 mg. of amylene hydrate). The dose is usually stated in milligrams of the avertin component only. As the amylene hydrate adds materially to the narcotic effect, it should be kept in mind that, with each dose of avertin, half this dose by weight of amylene hydrate is administered.

The total amount administered should not exceed from 6 to 8 cc. of avertin with amylene hydrate for women, or from 9 to 10 cc. for men, regardless of weight. Dosage tables are supplied by the firm.

Manufactured by Winthrop Chemical Company, Inc., New York. U. S. patents 1,572,742 (Feb. 9, 1926; expires 1943), 1,725,054 (Aug. 20, 1929; expires 1946), 1,882,984 (Oct. 18, 1932; expires 1949). U. S. trademark (Avertin) 233,204.

Tribromethanol is a white, crystalline powder, with a slight aromatic odor and taste; unstable in the air; sparingly soluble in water, about 1 in 35, readily soluble in purified petroleum benzin. Its aqueous solution is neutral to litmus. The solution is unstable. Tribromethanol melts at from 79 to 82 C.

Dissolve about 0.2 Gm. of tribromethanol in 10 cc. of water, add 1 cc. of sodium hydroxide solution, warm slightly, add 2 cc. of nitric acid and 1 cc. of silver nitrate solution: a yellow precipitate results, soluble in an excess of stronger ammonia water.

Dissolve about 0.1 Gm. of tribromethanol in 5 cc. of water at from 35 to 40 C., cool, add 1 cc. of a 10 per cent phenylhydrazine acetate solution: no precipitate should form even after thirty minutes (*dibromacetaldehyde*).

Dissolve about 0.1 Gm. of tribromethanol in 1 cc. of sulfuric acid: the solution is colorless (*readily carbonizable substances*). Dissolve about 0.5 Gm. of avertin in 50 cc. of water: separate portions of 10 cc. each of the filtrate yield no opalescence with 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution (*uncombined halides*); no turbidity with 1 cc. of diluted nitric acid and 1 cc. of barium nitrate solution (*sulfates*); no coloration or precipitation on saturation with hydrogen sulfide (*salts of heavy metals*).

Incinerate about 0.5 Gm. of tribromethanol, accurately weighed: the residue does not exceed 0.05 per cent. Dry about 1 Gm. of tribromethanol, accurately weighed, to constant weight over sulfuric acid: the loss in weight should not exceed 1 per cent. Transfer about 0.15 Gm. of tribromethanol to a bomb tube; determine the bromine content according to the Carius method; collect the precipitate of silver bromide in a Gooch crucible: the amount of bromine found should not be less than 84 per cent, nor more than 85.5 per cent.

AMYLENE HYDRATE.—Dimethylethylcarbinol.—$(CH_3)_2C_2H_5C.OH$.—Occurs as a clear, colorless, volatile liquid, possessing a penetrating odor, resembling a mixture of camphor and peppermint, and having a pungent taste. It is soluble in alcohol, chloroform, ether, glycerin and water (about 1 in 8). The specific gravity of amylene hydrate at 25 C. is from 0.803 to 0.807; it boils at from 97 to 103 C.

Amylene hydrate forms acicular hygroscopic crystals on cooling to low temperature. It is oxidized into acetic acid and acetone with chromic acid.

Dissolve 1 cc. of amylene hydrate in 20 cc. of water and divide into two portions of 10 cc. each; to one portion add 1 cc. of an ammoniacal solution of silver nitrate and heat on a water bath: no reduction takes place in ten minutes (*absence of aldehyde*); to the other portion add 0.1 cc. of tenth-normal potassium permanganate solution: no complete decolorization within ten minutes (*limit of amyl alcohol*). Shake 8 cc. of amylene hydrate with 0.6 Gm. of anhydrous copper sulfate: the latter does not become blue (*absence of water*).

Evaporate 20 cc. of amylene hydrate in a platinum dish on a water-bath to about 2 cc. and allow to evaporate spontaneously to dryness: the residue, if any, is colorless. Now dry at 100 C. and weigh: the weight of the residue does not exceed 0.05 Gm.

10. Mueller, Lillian B.: Report of Three Thousand Cases of Avertin Anesthesias, J. Indiana M. A. **29:** 175 (April) 1936.
11. Boyd, John: Avertin as Complete Anesthetic in Children: Survey of Seven Hundred Cases, Brit. M. J. **1:** 1120 (June 1) 1935.
12. Bourne, Wesley, and O'Shaughnessy, P. E.: One Thousand Avertin Anesthesias, Canad. M. A. J. **31:** 276 (Sept.) 1934.

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SATURDAY, SEPTEMBER 18, 1937

THE TOXICOLOGY OF NEW INDUSTRIAL COMPOUNDS

The introduction into industry of many new synthetic chemical compounds has created innumerable diagnostic and other clinical problems for the medical profession. McConnell [1] has indicated the nature of this development. The House of Delegates at the Atlantic City session, this year, authorized the establishment of a Council on Industrial Hygiene. Laboratories for the investigation of the toxicologic and pharmacologic properties of such compounds are now being developed in many industries.

In spite of this increasing recognition, medicine is frequently put in the position of attempting to lock the door after the horse has been stolen. Many industrial compounds have received wide use and caused considerable damage before their destructive properties have received sufficient investigation. An example is manifest from the study made by Lehman and Newman [2] of the Stanford University School of Medicine on propylene glycol, which has had wide use as a solvent for technical purposes. They determined the toxicity, hemolytic action, fate of the compound in the blood and in urine, absorption, content in the blood, excretion and diuretic effect. They found that propylene glycol, which incidentally may be considered as a prototype of many of the glycols now commercially available, has an acute toxicity less than half that of ethyl alcohol, that hemoglobinuria does not occur after ingestion of large doses, that the compound is rapidly absorbed from the gastro-intestinal tract, that rapid distribution after absorption occurs throughout the tissue, that combustion in the body proceeds at a constant rate, irrespective of dosage, and that the narcotic action is about one-third that of ethyl alcohol.

While this study is useful because of the applicability of its specific results, it serves also as an example of the type of study that should be followed prior to the introduction into industry, and particularly into medicine, of new synthetic chemicals. It is an established procedure of industrial chemical laboratories to determine the chemical and physical and technical properties of new products over a wide range. Should determination of the effects on the human organism be regarded as of less importance? What is needed is that technical chemistry shall be supplemented by pharmacology in its broadest sense in the introduction of these compounds. These studies should be carried out as part of a systematic investigation rather than left to chance.

Both McConnell's discussion and the investigations of Lehman and Newman indicate the importance of a definite policy with regard to new industrial synthetics. Indeed, much can be said for the view that such studies should be made mandatory before the introduction into industry of new chemicals.

1. McConnell, W. J.: Volatile Solvents as a Problem in Industrial Medicine, J. A. M. A. **109**: 762 (Sept. 4) 1937.
2. Lehman, A. J., and Newman, H. W.: Propylene Glycol: Rate of Metabolism Absorption, and Excretion, with a Method for Estimation in Body Fluids, J. Pharmacol. & Exper. Therap. **60**: 312 (July) 1937.

THE CITADEL

Dr. A. J. Cronin, author of a new medical novel, "The Citadel," after graduating in medicine practiced in South Wales in a coal mining area. He contributed several items to medical research, including one article entitled "Dust Inhalation by Hematite Miners" and another on "First Aid in Coal Mines." The list of British doctors who write for a living is long, and many of them, such as Francis Brett Young, Somerset Maugham, R. Austin Freeman, L. A. G. Strong and others of lesser rank, are quite successful. In the United States we have had a few successful physician-fictionists. The great medical novels have not been written by doctors but by those outside the profession. True, Oliver Wendell Holmes, S. Weir Mitchell and many others reflected the work of the doctor in their writings, but not one of their medical novels attained a stature comparable to their work in other fields. Perhaps the doctor is too close to his own work to do a really first-class novel about it. Among American contributions "Arrowsmith," by Sinclair Lewis and Paul DeKruif, reflected some of the difficulties that concern the worker in the field of medical research. Yet that novel was largely a reflection of the personal disturbances in the life of DeKruif and hence can hardly be considered representative.

"The Citadel," [1] published several months ago in Great Britain and just now released in the United States, purports to reflect the life of a young physician named Andrew Manson, whose life seems to follow rather closely that of A. J. Cronin. Out of college without a penny, he accepts a job in contract practice. Disappointed with what he can do there he next becomes associated with a surgeon in a nearby town, where he finds that he has to pay a percentage of his salary regularly to his chief. Next he is involved in research in London, where bureaucratic stupidity keeps

1. Cronin, A. J.: The Citadel, Boston, Little, Brown & Co., 1937.

him from the advancement that he seeks. He then purchases a dying practice and gets into Harley Street, where he finds that fee splitting prevails and commercialism seems to be the rule. The story and the formulas are, of course, familiar to American physicians. They have heard these abuses condemned so often by the profession itself that it is no new thing to see them condemned in fiction or in essay. In the United States, as in Great Britain, these abuses constitute but a small part of the medical scene. The Literary Supplement of the London *Times* succinctly evaluated the case in its review:

> As a novel Dr. Cronin's book may be reckoned his best piece of work. As propaganda it is lopsided. Any one familiar with the medical profession or with social work has met Dr. Cronin's characters here and there. True, he has given us the picture of honest doctors in great and humble positions: but not enough of them. All over the country today are county and municipal officers who care less for fees than for healing; in general practice are insignificant men and women living devoted, anxious lives with only fourteen days a year away from the clamorous telephone by day and night. In Harley Street are men who might stand beside Lister without shame. Above all, in the research departments of many a hospital are heroes and martyrs. These should have been made an offset to Dr. Cronin's selected types.

In England the publishers tried to boost the sales of the Cronin book not on its qualities as a novel but by calling attention to its controversial aspects. It was hoped to start an investigation in parliament. Endeavors were made to incite the British Medical Association to resolutions and perhaps a boycott. Doctors bought the book because doctors like to read about themselves, as do other people.

Taking an idea from the plan of the British publishers, the American publishers are attempting a similar procedure to help them with the sales of the Cronin book in this country. They are circulating a photostatic copy of a letter written to them by Hugh Cabot on the stationery of the Mayo Clinic. Dr. Cabot concludes his letter with the following paragraph:

> I shrewdly suspect that this difficulty is considerably more serious in this country than in England. It is certainly one of the problems which is rapidly forcing us to face the question of whether or not medicine can continue to be practiced under this system. He makes allusions to the practice of fee-splitting, which I confidently believe is very much less common in England than it is here. The various types of contract and semi-contract practice which he experienced are to be had here and are relatively similar.

"The Citadel" makes interesting reading, but it is not a fair picture of medicine in either Great Britain or the United States. Medicine has its scoundrels, its commercially minded practitioners, its inefficient and incompetent members. Is there any phase of human activity that does not have them? But medicine is proud of the fact that it cleans its own house and that it does its utmost to control these abuses without pressure from the outside. Its idealists are particularly proud of the fact that, unlike the cuckoo, they do not soil their own nests. What have the Cronins and the Cabots to gain by overemphasizing the small percentage of evil that every one knows about? Both Cronin and Cabot know better than to believe much of what they say. As a social document in Great Britain, "The Citadel" seems to have failed of its purpose. Quite certainly it will make even less of an impression in this country. To the American doctors who read it, "The Citadel" will reveal the evils of panel practice and the obvious failure of the British system of medical service to give the British worker anything approximating the quality of medical care available to American workers.

PANIC, PUBLICITY AND POLIO

In the Middle Ages, when plague swept across any community, the inhabitants fled to the neighboring hills in panic. They did not know the cause of the disease and they had no specific method of prevention. They did know that, when plague came, people died. In a book by Frederick Prokosch entitled "The Seven Who Fled" there is an accurate picture of a Chinese city confronted with cholera. Among the Chinese an attitude of apathy apparently develops associated with the certainty that some people must inevitably die when the devastating epidemic strikes. In civilized communities, people should no longer be stricken with panic in the presence of disease. Much has been learned concerning the causes, methods of prevention, diagnosis and treatment of many of the infectious diseases. Patients are isolated. Modern methods of prevention are used to immunize those who are exposed. Known contacts are kept under control and in most instances after a reasonable time the disease disappears from the community or returns to what is called its normal incidence.

Toward poliomyelitis in the United States a somewhat abnormal point of view seems to have developed. The total incidence of that disease in any one year in the entire country is certainly less than 10 per cent of the number of cases of any one of the other common infectious diseases. Yet because poliomyelitis is a visibly crippling disease, panic appears in the minds of the public, which is frequently reflected in the statements and actions of public officials. Yet if ever rationality was needed it is demanded in the approach to this problem. One wonders, for example, whether the number of disabled as far as their hearts, kidneys and ears are concerned is any less from scarlet fever than the number of cripples of the arms and legs affected by poliomyelitis. Yet people everywhere are far more afraid of poliomyelitis—not knowing that the permanent "heart cripple" constitutes a much more serious problem. It is possible to splint, to reeducate and to rehabilitate a paralyzed limb. We have not yet found any method of splinting or reeducating a damaged heart, and the rehabilitation of the "heart cripple" is indeed difficult.

Men fear most what they do not understand. Let physicians and health officers alike admit that there is much that is not known concerning poliomyelitis.

We have not yet determined the exact cause of this disease. We know something concerning possible methods of transmission but we do not know with certainty exactly how it is transmitted to most human beings. We seem to know that considerable numbers of people have a natural resistance to the disease so that they would probably not become infected even if exposed.

Before the people of the country at this time, preventive medicine presents a lamentable aspect. Many health officers, following the lead of Chicago, are delaying the opening of schools. It is not clear whether this creates or allays panic. Some health officers are publishing day by day lists of cases actually diagnosed—with large lists of those suspected of having poliomyelitis. This enhances the panic. In other communities health officers have announced that they will not delay opening the schools or close the schools, since this seems to be contrary to fairly well established public health practice. In 1932 the health officers of Boston, San Francisco, Philadelphia, Los Angeles, Cincinnati and Chicago declared themselves opposed to delaying the opening of schools and to closing of schools to prevent epidemics of infantile paralysis. Similar views were expressed by Sir George Newman, Minister of Health in Great Britain, and by the Medical Director in the Department of Social Affairs of Oslo, Norway. Certainly there has been no new information or evidence since 1932 to warrant a change of opinion. There has only been new emphasis on poliomyelitis and perhaps too much publicity. Without the overemphasis in the press the vast majority of people would not have been concerned by the few hundreds of cases among many millions of people. The time would seem to be ripe for some organization in the public health field, either the Conference of State and Provincial Health Officers or the American Public Health Association, to endeavor to draw up some sort of regulations in relationship to this disease. Otherwise the ignorance of health officials and physicians will be made the excuse for erratic performances resulting from panic.

Current Comment

THE ZINC SULFATE SPRAY FOR THE PREVENTION OF POLIOMYELITIS

The successful use of a zinc sulfate spray in the prevention of experimental poliomyelitis in monkeys by Armstrong, Sabin, Schultz and their co-workers has stimulated much interest in its effectiveness as a preventive of the disease in human beings. Schultz demonstrated at Stanford University that in the experimental infection a solution containing 1 per cent of zinc sulfate, 1 per cent of pontocaine and 0.5 per cent of sodium chloride in distilled water is most effective in the monkey. The use of this technic in the human being has been too variable and uncontrolled to permit even an approximate estimate of its value. Dr. J. C. Geiger, the director of public health of San Francisco, and his distinguished committee have recommended that the use of this spray must be strictly limited until the proper technic has been worked out. There are possible side actions of the local anesthetic. Any physician applying the spray should be cognizant of possible symptoms of poisoning. The hazard of using a long tipped atomizer in the vicinity of the cribriform plate is also important. Attempts at home medication are absolutely valueless. The San Francisco report also states that no change in the constituents of the solution should be made without an investigation of the experimental result on monkeys. Treatments at present should be conducted in adequately supervised centers. Of special importance is the keeping of records of all treatments and the follow up of patients receiving the treatment. Only thus may adequate information on the preventive action be determined. In view, moreover, of the tendency of infantile paralysis to become rapidly less prevalent about the end of September and early October, the futility of starting such procedures at this time is readily apparent. If the evidence obtained this year is in any way encouraging, plans for determining the effectiveness of the attempted preventive might be worked out so that something resembling a serious scientific experiment may be tried next June, July and August.

MOTION PICTURE EDUCATION

Already many reservations[1] have been made for the motion picture film on syphilis, prepared jointly by the American Medical Association and the United States Public Health Service. It has become necessary to deny some requests although now several extra copies of the film are available. County medical societies, hospital conferences, medical schools and other assemblages of physicians have begun to take advantage of modern methods of visual education. The talking motion picture on syphilis was planned primarily for this purpose. Attention should be called also to the talking motion pictures, silent motion pictures and slide lectures now being offered by various medical industries. These are lent to medical societies without charge. At the Atlantic City session of the American Medical Association a talking picture film, developed by the American Committee on Maternal Welfare, was shown to the Section on Obstetrics, Gynecology and Abdom-

1. Organizations desiring to avail themselves of this film, either by purchase or by loan, may communicate with Dr. Thomas G. Hull, director of the Bureau of Exhibits of the American Medical Association, 535 North Dearborn Street, Chicago.

The following reservations for the motion picture film on syphilis have been made:

September 9.—The Hidalgo County Medical Society, County-City Hospital, Edinburg, Texas.
September 21.—Clinical Congress of the Connecticut State Medical Society, Dr. Maurice J. Strauss, 41 Trumbull Street, New Haven, Conn.
September 29.—Staff Meeting, Veterans' Administration, Hines, Ill., Dr. W. E. Kendall, chief medical officer.
October 6.—Eighty-seventh annual session of Medical Society of the State of Pennsylvania, Philadelphia, Dr. Walter F. Donaldson, secretary, 8104 Jenkins Arcade, Pittsburgh.
October 8.—Meeting of the Fifth District, Cleveland, Dr. C. L. Cummer, 1010 Hanna Building.
October 14-15.—Medico-Military Inactive Duty Training Unit, Mayo Clinic, Rochester, Minn., Dr. F. L. Smith.
October 14-15.—Annual meeting of Vermont State Medical Society, Dr. A. B. Soule Jr., secretary, Mary Fletcher Hospital, Burlington, Vt.
October 16, 23 and 30.—Dr. E. T. Sellers, chairman, Committee on Venereal Disease Control, Jacksonville, Fla., if duplicate is available.
November 4.—Evanston Branch meeting of the Chicago Medical Society, Dr. Harold C. Lueth, 636 Church Street, Evanston.
November 5.—For monthly meeting of the local medical society, Dr. R. D. Millard, 378 Young Hotel Building, Honolulu, Hawaii.
December 29.—Saranac Lake Medical Society, Dr. Edwin M. Jameson, president, 6 Church Street, Saranac Lake, N. Y.
January 20.—Dr. S. S. DeVaux, United, Pa.

inal Surgery. This film was made with the aid of Mead Johnson & Company and is planned to educate the public in the importance of antepartum care and in the importance of suitable feeding of the child. The film presents scientific material and is not in any sense of the word an advertisement. In its development Dr. Fred L. Adair, professor of obstetrics and gynecology at the University of Chicago, Dr. James R. McCord, professor of obstetrics and gynecology at Emory University, Dr. Everett D. Plass, professor of obstetrics and gynecology at the University of Iowa, Dr. Arthur J. Skeel, specialist in obstetrics and gynecology of Cleveland, and Dr. Philip F. Williams, professor of obstetrics and gynecology at the University of Pennsylvania, participated. It has been suggested that the film be shown not only to the expectant mother but also, in fact, to boys and girls of high school and college age. Certainly it will be well for physicians to view this film so as to be in a position to advise their patients concerning it. The development of the motion picture and of the talking motion picture for the advancement of medical education has been a gradual process in which many individual physicians have done pioneer work. Apparently their efforts are now bearing fruit. The time may well come when county medical society meetings will regularly include postgraduate instruction by leaders in the profession from all over the world whose knowledge, practice and experience are now made everywhere available directly in this form.

PUBLIC HEALTH FEATURES OF RHEUMATIC HEART DISEASE

Rheumatic heart disease, according to Hedley,[1] should not be considered a complication of rheumatic fever but its chief manifestation. Although this disease is not included in the synopsis on the control of communicable diseases prepared by a committee of the American Public Health Association, it offers several features which justify its examination in the same light as diseases which are included in that synopsis. In following the method adopted by the American Public Health Association, Hedley discusses the definition of rheumatic fever, its recognition, the probable source of infection, the probable mode of transmission, and susceptibility and immunity. The greatest frequency of rheumatic fever occurs from 7 to 10 years of age, with the peak incidence of initial cases occurring at about 7 years. Furthermore, an attack of rheumatic fever results in increased susceptibility to further attacks. The disease is found only in human beings and has not been experimentally transmitted. It is most frequent in cooler regions of the temperate zone. It is slightly more common in females and in white persons than in Negroes. The disease is found more in urban than in rural populations and more frequently among the poor than among the well to do. Malnutrition and poor living conditions seem to predispose to rheumatic infections. Rheumatic heart disease accounts for from 15 to 40 per cent of clinical heart disease in the United States. The exact proportion depends on the locality. In spite of the fact that the prevention of a disease is usually dependent on adequate knowledge concerning its etiologic agent, mode of transmission and a reliable objective clinical serologic or roentgenologic basis for diagnosis, some preliminary tentative methods of control may be considered. Early recognition of the disease is of primary importance. Isolation of individuals in active stages is desirable. Because of the chronicity of the disease strict concurrent disinfection is almost impossible, but reasonable care should be exercised. No satisfactory methods of terminal disinfection, quarantine or immunization are at present available. The most important general public health measure in combating the disease urged by Hedley is the more thorough examination of school children for evidences of rheumatic heart disease. He emphasizes particularly that all pupils should be stripped to the waist for school physical examinations. This unusual method of approach to the rheumatic heart disease problem demonstrates that wide gaps in knowledge still exist. The mode of approach to the problem, however, should serve to help fill the gaps and to apply more effectively, from a public health point of view, the knowledge that does exist.

1. Hedley, O. F.: Salient Public Health Features of Rheumatic Heart Disease, Pub. Health Rep. **52**: 164 (Feb. 5) 1937.

PNEUMOTHORAX FROM EXPERIMENTAL OVERINFLATION OF LUNG

Macklin[1] introduced a catheter in the right lower lobe of a cat's lung and insufflated osmic acid vapor in air for the purpose of fixing living lung substance. The insufflated air was supplied from the compressed air mains of the building. The animal died during the experiment as the result of a double pneumothorax with massive collapse of the lung, and the necropsy suggested the presence of air paths through the pulmonic interstitial tissue. The experiment was repeated a number of times. It was learned that the pneumothorax was related to overinflation of a limited part of the lung and that the osmic acid had nothing to do with it. Microscopic examination of the lung showed the presence of a fibrinous exudate, sometimes containing blood cells, which gathered in the alveoli; also a thickening of the finer perivascular sheaths, which became infiltrated with fluid, probably from the capillaries. The effect of the experiment on the animal depended on the air pressure used and the duration of the insufflation. When the air pressure was high, a swelling of the abdomen and chest quickly appeared and the respiratory movements ceased. When the insufflation was kept up vigorously enough the root of the neck swelled and later the axilla, as the air extended through the connective tissue out of the superior mediastinum along the course of the great blood vessels. It seems likely, Macklin says, that finely subdivided air breaks through from the alveoli that abut on the perivascular tissue, which has become weakened through the imbibition of fluid. The bases of these alveoli collectively form a tunnel in which the blood vessels lie, and when that portion of the lung is hyperinflated this tunnel enlarges or expands like the inner circle of an expanding doughnut-shaped rubber balloon; that is, the hole becomes larger when the doughnut is blown up to a larger size. In this case

1. Macklin, C. C.: Pneumothorax with Massive Collapse from Experimental Local Overinflation of the Lung Substance, Canad. M. A. J. **36**: 414 (April) 1937.

the rubber of the inner boundary is actually being stretched; likewise the membrane of the alveolar bases that bound the perivascular spaces during hyperinflation. Under normal conditions there is insufficient air pressure to produce these results. It is assumed, though not entirely proved, that the insufflated air breaks through at points in the periphery of the perivascular sheath system of the inflated part of the lung. The minute globules of air coalesce into larger ones, which move toward the hilus along lines of least resistance. The stream of air dissects its way to the root of the lung, where it occupies the sheaths of the great pulmonary vessels and then invades the mediastinum, which it distends and may even rupture, discharging the air into the pleural cavity to produce pneumothorax and massive collapse of the lung. The possibility was carefully considered that air might be leaking directly out of the inflated lobe through the pleura and thus cause a pneumothorax; in several typical cases, however, there was no evidence that the air was going directly through the pleura. The clinical application of these interesting experiments is not as yet clear. It is sufficient now to ask whether massive collapse with spontaneous pneumothorax may not arise in a human lung in which a main bronchus has been plugged with mucus and in which air may still enter during inspiration but in which the plug prevents its return during expiration. Pressure thus would arise in the blocked portion of the lung, owing to the accumulation of air. The alveolar bases abutting on the blood vessels might then become pervious to air and allow it to escape into the perivascular sheaths, from which it would go on into the mediastinum and possibly rupture into the pleural cavity. Such a mechanism would not involve a cough. LeWald [2] believes that in such cases there is a third type of massive collapse, which is due neither to atelectasis nor to rupture of the pleura.

THE DANGER OF EATING RHUBARB LEAVES

Because rhubarb sauce and rhubarb pie are frequent articles in the American diet, the use of the leaf blades for greens has frequently been suggested. J. H. Beattie [1] states that numerous cases of more or less serious illness and some fatalities have been reported in Europe and North America from the use of rhubarb leaves. The rhubarb leaf blades were eaten boiled in the belief that they were substitutes for the common greens. A fatal case of poisoning following the ingestion of rhubarb leaves was reported in THE JOURNAL, Aug. 23, 1919, page 627, while additional correspondence appeared in the issues of Sept. 20 and Oct. 11, 1919. Beattie states that "owing to the high content of oxalic acid and its soluble salts found in rhubarb leaves it is recommended that they be left entirely alone and not used under any circumstances as food. In the stalks, however, the oxalic acid is present in smaller amount and largely in insoluble form, and for this reason is harmless."

2. LeWald, L. T., in discussion of Potter, R. P.: Conditions Which Result in Collapse of the Lung, Radiology **17**: 271 (Aug.) 1931.

1. Beattie, J. H.: Rhubarb Production, Leaflet 126, Bureau Plant Industry, Division of Fruit and Vegetable Crops, U. S. Department of Agriculture.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

New Division of Industrial Hygiene. — The Alabama State Department of Health has created a division of industrial hygiene with headquarters in Montgomery, and with Dr. William F. Queen, a graduate of Harvard University Medical School, in charge.

ARIZONA

Tuberculosis Mortality in 1936.—A total of 1,101 deaths from tuberculosis in Arizona in 1936 gave a mortality rate of 264.9 per hundred thousand of population, the highest registered rate in the state in the past three years, according to *Public Health News*. The greatest number of deaths from this cause in the last decade occurred in 1929, when there were 1,471 deaths, giving a rate, based on estimated population at that time, of 345.8 per hundred thousand of population. At present tuberculosis is the leading cause of death in the state, comprising 17 per cent of the total mortality. Of the 1,101 deaths in 1936 there were 778 men and 323 women, an excess of 455. The disease accounted for the deaths of 678 white persons, 209 Mexicans, 163 Indians and fifty-one of other races. The largest number of deaths occurred in the age group 35-44. According to geographic distribution of these deaths, it is startling to note that 39 per cent of those persons dying from tuberculosis actually contracted the disease in Arizona, the report states. Of the remaining 61 per cent, 17 per cent contracted the disease in places unknown or unstated on the death certificate. The length of residence in the state for persons who died of tuberculosis in 1936 is as follows:

Length of Residence	Number	Per Cent
One month	35	3
1–3 months	87	8
4–6 months	60	5
7–12 months	98	9
1–4 years	194	18
5–9 years	122	11
10 years and over	447	41
Unknown	58	5

ARKANSAS

Changes in Health Departments.—Dr. Floyd S. Dozier, Clarendon, has been appointed health officer of the newly organized health unit in Polk County, with headquarters in Mena. He was succeeded by Dr. Albert S. J. Clarke, Little Rock, in a district unit composed of Arkansas, Prairie and Monroe counties, with headquarters in Clarendon. Dr. Winston C. Riggins, Little Rock, was named to the district composed of Ashley, Chicot and Desha counties, with headquarters at Hamburg. Other new appointments include the following:

Dr. Julius B. Askew, Little Rock, Independence County, with headquarters at Batesville.

Dr. Max F. McAllister, Fayetteville, Miller County, with headquarters at Texarkana.

Dr. Leroy L. Fatherree, Little Rock, Craighead and Poinsett district, with headquarters at Jonesboro.

According to the report, Independence, Craighead, Poinsett, Miller and Polk counties have been newly organized on a permanent basis.

CALIFORNIA

Society News.—Dr. Clarence A. Mills, James T. Heady professor of experimental medicine, University of Cincinnati College of Medicine, Cincinnati, addressed the Southern California chapter of the American Society of Heating and Ventilating Engineers and the Los Angeles County Medical Association, August 31, on "Climatic and Weather Factors in Relation to Health and Disease and Their Application to Air Conditioning."——W. F. Washburn, Ph.D., Rochester, N. Y., discussed "Ailing Feet" before the San Francisco County Medical Society, September 14.

FLORIDA

Malaria Project Approved.—The Rockefeller Foundation will finance a survey on malaria in Escambia County, with Dr. John E. Elmendorf Jr. of the foundation staff in charge of headquarters in Pensacola. Of the $8,000 to be spent for the first year's work, the city and county will each pay $1,000. It is expected that the control areas will be selected on the basis of the intensity of malaria existing in the district, the

adaptability of the local problem to different types of malaria control and the local interest shown in the solution of the problem. Dr. Elmendorf will also be director of a malaria division to be formed in the Escambia County health department.

GEORGIA

Public Relations Bureau. — The Medical Association of Georgia has established a public relations bureau to work in cooperation with the state departments of public welfare and health, it is reported. With offices at the association's headquarters, 38 Prescott Street N. E., Atlanta, the bureau will disseminate health information in a statewide educational campaign among physicians and the public.

Society News.—At a meeting of the Jackson-Barrow Counties Medical Society in Jefferson, July 5, Dr. James T. Stovall Jr., Jefferson, read a paper entitled "Differential Diagnosis of Lesions of the Right Side of the Abdomen with Special Reference to Urology."——The Fourth District Medical Society was addressed at Thomaston, August 11, among others, by Drs. Willis P. Jordan, Columbus, on "Diagnosis and Treatment of Bronchiectasis," and Weldon E. Person, Atlanta, "Anorectal Fistula."——A symposium on allergy was presented before the Fulton County Medical Society, September 2, by Drs. Arthur G. Fort, Lester A. Brown Jr., Abner W. Calhoun, Thomas S. Claiborne, Clarence L. Laws, Hal M. Davison, Mason I. Lowance and William R. Crowe Jr., all of Atlanta.

ILLINOIS

Society News.—The *Medical News* of Rock Island County made its appearance in August as the official publication of the Rock Island County Medical Society, with Dr. George W. Dryer as editor in chief. Dr. Warren H. Cole, Chicago, addressed the county medical society, September 14, on "Pathogenesis, Diagnosis and Treatment of Chronic Cholecystitis."——Dr. Paul H. Harmon, Chicago, discussed poliomyelitis before the McDonough County Medical Society in Macomb, July 14. —— The Sangamon County Medical Society was addressed in Springfield, September 2, by Drs. Burton Lyman Stewart on treatment of urogenital tract infections with sulfanilamide; William DeHollander, "Postoperative Pulmonary Collapse: Roentgen Aspects," and George H. Fleischli, "Fractures About the Elbow." All are from Springfield.

Chicago

Dr. Sloan Named Professor of Medicine.—Dr. LeRoy H. Sloan, associate professor of medicine, University of Illinois College of Medicine, has been appointed professor of medicine, effective September 1. Dr. Sloan graduated at Rush Medical College in 1917.

Symposium on Occupational Disease.—Northwestern University Medical School is sponsoring a symposium on industrial disease and hygiene at Thorne Hall, September 27-28. The following program will be presented:

Dr. Samuel M. Feinberg, Rôle of Allergy in Industry.
Dr. Marion B. Sulzberger, New York, Rôle of Allergy in Industrial Dermatoses.
Dr. Leroy U. Gardner, Saranac Lake, N. Y., Some Phases of the Pathology of Silicosis.
Dr. Eugene P. Pendergrass, Philadelphia, The Healthy Chest and the Modifying Influences of Silicosis and Silicosis with Infection.
Clarence W. Muehlberger, Ph.D., Toxicology of Industrial Solvents.
Dr. Alice Hamilton, Boston, Some Recent Developments in the Field of Industrial Solvents.
Dr. Robert A. Kehoe, Cincinnati, Industrial Lead Poisoning.

Dr. James A. Britton, medical director, International Harvester Company, will conclude the afternoon's program with a round table discussion on occupational disease. At the dinner in the evening, Mr. O. E. Mount, president of the board of governors, department of occupational disease at the university, will preside and the speakers will be Dr. Irving S. Cutter, dean of the medical school, who will discuss "The Rôle of the Medical Unit in Industry," and Frances Perkins, secretary, U. S. Department of Labor, Washington, D. C., "Health in Industry."

Group to Study Sex Degeneracy.—A group of neurologists and psychiatrists met in the state's attorney's office, August 27, to discuss the problem of dealing with persons belonging in the group of mental disorders not covered by the legal definition of insanity and feebleminded who may be apprehended for some crime. The group consisted of Drs. Peter Bassoe, H. Douglas Singer, Clarence A. Neymann, Francis J. Gerty, David Slight, Paul L. Schroeder, David Rothman, Lewis J. Pollock, Ralph C. Hamill and Harry R. Hoffman. There has been a recent increase in sex crimes. Under the present statutes sex criminals not insane or feebleminded may receive only short sentences, and they frequently repeat their crimes. A subcommittee consisting of Drs. Pollock, Gerty, Hoffman, Schroeder and Rothman was appointed to prepare a definition of the mental disorders under consideration, particularly of sexual psychopathy. It is to recommend to the committee of the whole plans for statutes which, as in the case of the Briggs law of Massachusetts, would provide means for the early recognition of sexual and other psychopaths. Such laws would also provide for commitment of these persons to a hospital for observation and diagnosis, as does the Colorado law of 1924 dealing with insanity as a defense, and for treatment and isolation of vicious and antisocial characters until they are pronounced cured by a suitable board of psychiatrists.

INDIANA

State Medical Meeting at French Lick, October 4-6.—The eighty-eighth annual session of the Indiana State Medical Association will be held at the French Lick Springs Hotel, French Lick, October 4-6, under the presidency of Dr. Edmund D. Clark, Indianapolis, and with the Orange County Medical Society acting as host. Out of state speakers will include:

Dr. Sumner L. S. Koch, Chicago, Infections of the Hand.
Dr. Frank J. Heck, Rochester, Minn., Interpretation of Routine Laboratory Findings for the General Practitioner.
Dr. Jesse O. Arnold, Philadelphia, Fluid Balance and Dehydration in the Prevention and Control of Eclampsia.
Dr. Albert C. Furstenberg, Ann Arbor, Mich., Acute Infections of the Cervical Region and Mediastinum.
Dr. John S. Lundy, Rochester, Minn., Sacral Anesthesia.
Dr. Joseph Brennemann, Chicago, Appendicitis in Childhood.
Dr. Louis A. Buie, Rochester, Minn., Diseases of the Anus and Rectum.
Dr. Karl A. Menninger, Topeka, Kan., The Psychoneurotic and the General Practitioner.
Dr. Bernard H. Nichols, Cleveland, Roentgenology as an Aid to Diagnosis of Lesions in the Upper Right Side of the Abdomen.
Dr. Frank H. Lahey, Boston, Some of the Newer Developments in Thyroid Disease.

The annual banquet will be held Tuesday evening. Dr. Roscoe L. Sensenich, president of the association during 1936, will be presented with his certificate of merit and speakers will include Dr. Irvin Abell, Louisville, Ky., President-Elect, American Medical Association. Entertainment will include the annual golf tournament at the Hill Course Monday and the fourth annual trap shooting tournament at the French Lick Springs Trap and Skeet Club Monday afternoon. Dr. Edith M. Boyer Schuman, Bloomington, will address the annual dinner meeting for women physicians Monday evening on "Sulfanilamide." Speakers at the meeting of the woman's auxiliary Tuesday include Dr. Paul A. Teschner, Chicago, Bureau of Health and Public Health Instruction, American Medical Association, on "The Doctor's Wife." Dr. Bernard H. Nichols, Cleveland, will address the Indiana Roentgen Society October 6 at a luncheon meeting. Fraternity and class reunion luncheons will be other features of the convention.

IOWA

Laboratory Services Expanded.—Under provisions of a special appropriation made by the forty-seventh general assembly, the following laboratory procedures are now available, without cost, to all licensed physicians in Iowa, at the state hygienic laboratory, Iowa City:

Wassermann and Kahn tests and at the option of the laboratory the Kline test.
Dark-field examination of chancre fluid for Spirochaeta pallida.
Examination of smears for gonorrhea.
Sputum examination for Bacillus tuberculosis (limited to smears).
Throat cultures for organisms such as Bacillus diphtheriae, Streptococcus haemolyticus and bacteria associated with Vincent's infection.
Agglutination tests for diseases such as typhoid and paratyphoid, undulant fever, tularemia and the Rocky Mountain spotted fever-typhus group.
Blood cultures for typhoid and undulant fever.
Fecal (and urine) examinations, limited to specimens for diagnosis or release and to those pertaining to special epidemiologic investigations.
Examination of milk, necessarily limited to specimens in connection with outbreaks or special investigations.
Examination of the brain of animals for evidence of rabies.

For laboratory services other than those listed above and of a nonroutine character, it is advised that the approved clinical laboratories of the state be consulted. If such facilities are not accessible to the physician making the request, the state hygienic laboratory will render the service for a small fee, which will be deposited in a reserve fund for purposes of research. Correspondence should be directed to the laboratory, Medical Laboratories Building, State University of Iowa, Iowa City.

KANSAS

Personal. — Dr. Floyd C. Beelman, Wichita, has been appointed health officer of Sedgwick County.——Dr. John E. Attwood, La Crosse, has been appointed health officer of Rush County, succeeding Dr. Norval W. Robison, Bison, who held the position four years.

Annual Registration Now Due.—Physicians licensed to practice medicine in Kansas are required to renew their licenses annually between July 1 and October 1 and to pay a fee of $1

to the secretary of the board of medical registration and examination. The secretary must strike from the register of licensed physicians the names of all physicians who fail to pay their annual registration fees as required by law. Physicians whose names are so removed may be reinstated by paying the secretary $5 and submitting to him satisfactory proof of moral fitness.

MICHIGAN

Personal.—Dr. Joseph W. Davis, Charlotte, has resigned as health officer of Eaton County to accept a similar position in Marion County, W. Va. Dr. Morley B. Beckett, health officer of Allegan County, will serve as acting health officer of Eaton County until Dr. Davis's successor can be selected, according to the state medical journal.——Dr. David Kliger has been appointed coordinator in Wayne County for the administration of the afflicted crippled children acts. Dr. Kliger took office September 1 with headquarters at the juvenile division of the probate court, 1025 East Forest Avenue, Detroit.——Dr. George A. Hays, formerly state director of the local health administration of Arizona, Phoenix, has been appointed health officer of Flint.

Clinic to Study Rheumatism.—A study of rheumatism, to determine the causes and if possible a cure, will be undertaken immediately in a new clinic to be established and maintained at the University of Michigan Hospital, Ann Arbor, by the Rackham Fund, according to the Ann Arbor *News*. Ten thousand dollars will be available annually for several years. Dr. Cyrus C. Sturgis, professor and head of the department of internal medicine at the university, is chairman of a special committee appointed by Dr. Albert C. Furstenberg, dean of the medical school, to establish the clinic and supervise its operation. Others are Drs. Harley A. Haynes, director of the University Hospital, and Carl E. Badgley, professor of surgery. Dr. Richard H. Freyberg will be in charge of the research on a full time basis.

State Medical Meeting at Grand Rapids.—The seventy-second annual convention of the Michigan State Medical Society will be held at Grand Rapids, September 28-30, under the presidency of Dr. Henry E. Perry, Newberry. The Kent County Medical Society will act as host. Scientific sessions will be held at the Civic Auditorium and hotel headquarters will be at the Pantlind Hotel. Out of state speakers before section meetings will include the following:

Dr. Alvan L. Barach, New York, Physiologic Treatment of Congestive as Contrasted to Peripheral Circulatory Failure.
Dr. Donald C. Balfour, Rochester, Minn., Cancer of the Stomach.
Dr. William Wayne Babcock, Philadelphia, Resecting the Cancerous Colon Without Permanent Colostomy.
Dr. Otto H. Schwarz, St. Louis, Prevention and Treatment of Late Toxemias of Pregnancy.
Dr. Albert Graeme Mitchell, Cincinnati, The Thymus Gland.
Dr. Howard J. Parkhurst, Toledo, Ohio, Treatment of Coccogenous Sycosis.

Tuesday afternoon the first general assembly will be addressed, among others, by Dr. John H. J. Upham, Columbus, Ohio, President of the American Medical Association. Included among the speakers at the various general sessions will be:

Dr. Balfour, Diagnosis and Treatment of Gastro-Intestinal Hemorrhage.
Dr. Ernest E. Irons, Chicago, Pulmonary Complications in Adult Medical and Surgical Patients.
Dr. John T. Murphy, Toledo, Use of Roentgen Ray in the Treatment of Fibroid Tumors and Bleeding of the Menopause.
Dr. Schwarz, Cesarean Section—Its Indications and Technic.
Dr. William P. Healy, New York, Diagnosis and Treatment of Cancer of the Cervix and of the Corpus Uteri.
Dr. Claude S. Beck, Cleveland, Recent Advances in Surgery of the Heart.
Dr. Oliver S. Ormsby, Chicago, Yeast Dermatoses—Contact Dermatitis.
Dr. Mitchell, What I Do Not Know About Endocrines.
Dr. William L. Benedict, Rochester, Minn., Optic Neuritis: Its Etiology, Diagnosis and Treatment.
Dr. Paul H. Holinger, Chicago, Acute Laryngotracheobronchitis.
Dr. George A. Harrop, Brooklyn, Diagnosis and Treatment of the Adrenal Cortex.
Dr. George P. Reynolds, Boston, Diagnostic and Therapeutic Value of the Medical Society Study of Cases.
Dr. Foster Kennedy, New York, The Psychiatrist's Responsibility Toward the Criminally Insane and Toward Society.
Dr. John F. Erdmann, New York, Curiosities and Rarities in Surgery.
Dr. Babcock, Surgical Problems That Confront the General Practitioner.

Wednesday evening the fifth general assembly will be designated "president's night." Dr. Thomas Parran Jr., surgeon general, U. S. Public Health Service, will speak, among others, on "The Medical Profession versus Syphilis." During the meeting of the woman's auxiliary Dr. Henry A. Luce, Detroit, will address a luncheon session on "How to Get Along with Your Nervous Relatives."

MINNESOTA

Graduate Courses.—The Center for Continuation Study of the University of Minnesota, Minneapolis, announces a series of eight graduate medical institutes to be held during the coming school year. They will begin the first Monday of each month from October 1937 to May 1938 and will last one week. Members of the staff will be selected from the faculty of the University of Minnesota Medical School, the Mayo Foundation and the extension division of the state medical association. The theme of the first course, October 4-9, will be disease of the heart. The didactic lectures and demonstrations will be given in the classrooms of the center and the bedside teaching at the University of Minnesota Hospitals, Minneapolis General Hospital, Lymanhurst School for Rheumatic Children and Ancker Hospital, St. Paul. Future subjects will be announced one month in advance of each institute. Any physician who is a member of his local medical society may attend. Erected late in 1936 at a cost of $300,000, the Center for Continuation Study is used jointly by the professional schools of the University of Minnesota for intensive resident graduate instruction and contains living rooms for seventy-eight graduate students, dining hall, lounge, library, chapel, classrooms, administrative offices and parking garage. Julius M. Nolte is director, and Dr. William A. O'Brien, associate professor of pathology and preventive medicine and public health, is a representative of the medical faculty.

MISSOURI

Society News.—The Jackson County Medical Society has organized a medical business bureau with W. H. Bartelson as manager, according to its bulletin August 21. A change in the policy of the bulletin is announced in this issue, including a new cover and expansion of news and editorial features and a return to the use of a former name, the *Weekly Bulletin*. It has recently been known as the *Medical Journal*.

Personal.—Dr. William E. Taylor has been appointed full time health director and instructor in bacteriology and physiology at Teachers' College, Springfield. According to the report, Dr. Taylor, who will give up his private practice, is the son of J. A. Taylor, founder of the Springfield Normal School, which preceded the state teachers' college.——Dr. Raymond H. Runde, Mount Vernon, has been appointed superintendent of the Missouri State Sanatorium at Mount Vernon, succeeding Dr. William J. Bryan, who resigned to become superintendent and medical director of the Municipal Tuberculosis Sanatorium at Rockford, Ill.

NEBRASKA

Annual Registration Now Due.—Physicians licensed to practice medicine in Nebraska are required by law to register with the Department of Public Welfare annually, on or before October 1, and to pay a fee of $1. A license expires if the licentiate fails to register, but within the thirty days next following its expiration it may be revived by the payment of the registration fee and a penalty of $1. If that is not done, an order of revocation is issued and thereafter the revoked license can be reinstated only on the recommendation of the board of examiners in medicine and on the payment of the renewal fees and penalty then due.

NEVADA

Venereal Disease Program.—Dr. Byron H. Caples, Reno, has been appointed supervisor of the program for control of venereal disease recently initiated by the state board of health.

State Medical Meeting at Ely September 24-25.—The thirty-fourth annual meeting of the Nevada State Medical Association will be held in Ely, September 24-25, at the Nevada Hotel, under the presidency of Dr. Charles E. Secor, Elko. The speakers will be:

Dr. Louis E. Viko, Salt Lake City, Utah, Present Day Methods of Treatment of Heart Disease.
Dr. Donald C. Collins, Los Angeles, The Value of Papaverine Hydrochloride in the Treatment of Postoperative Pulmonary Embolism.
Dr. Joseph E. Tyree, Salt Lake City, Lesions of the Epiphysis in Children.
Dr. Howard P. Kirtley, Salt Lake City, Clinical Studies of Sterility in Women.
Dr. John M. Flude, Hollywood, Calif., Educating the Public About Cancer.
Dr. Leland R. Cowan, Salt Lake City, Factors in the Management of Malignancies of the Mouth.
Dr. E. Eric Larson, Los Angeles, Major Principles of Intestinal Surgery.
Dr. John C. Ruddock, Los Angeles, Peritoneoscopy, Technic and Clinical Experiences.
Dr. Byron H. Caples, Reno, Venereal Disease Control in Nevada.
Dr. Frederick T. Foard, San Francisco, Public Health.
Dr. Fred L. Adair, Chicago, Maternal and Neonatal Care.

NEW YORK

Society News.—Dr. Leon E. Sutton, Syracuse, addressed the annual joint outing meeting of the Syracuse and Utica academies of medicine at the Yahnundasis Golf Club, September 16, on "Facial Injuries and Their Repair."——Dr. Foster Kennedy, New York, addressed the Medical Society of the County of Westchester at Grasslands Hospital, Valhalla, September 21, on "Treatment of Acute Head Injury."

Dr. Parsons Resigns as Commissioner of Mental Hygiene.—Dr. Frederick W. Parsons, state commissioner of mental hygiene since 1927, has tendered his resignation to take effect October 1. Dr. Parsons, who is 61 years old, graduated from the University of Buffalo School of Medicine in 1901 and entered the state hospital service in 1902 as a member of the staff of the Hudson River State Hospital, Poughkeepsie. He remained at Poughkeepsie until 1919, when he was appointed superintendent of the Buffalo State Hospital. In 1926 he was made medical commissioner of the New York State Hospital Commission and in 1927 commissioner of mental hygiene.

Personal.—Dr. Alfred J. Roach has been appointed superintendent of the Broome County Tuberculosis Hospital, Chenango Bridge, to succeed Dr. Charles H. Cole, who resigned because of ill health. Dr. Roach has been assistant superintendent and medical director since 1932.—— Dr. John Rosslyn Earp, recently director of public health of New Mexico, Santa Fe, has been provisionally appointed medical editor in the division of public health education of the New York State Department of Health.—— Drs. Austin J. Stillson and William C. Armstrong, Windsor, recently were presented with framed scrolls by the citizens of Windsor township for their community services through many years. The presentation was made by Dr. Samuel M. Allerton, Binghamton, president of the Broome County Medical Society, at a community gathering August 5.

New York City

Personal.— Dr. Theodore Rosenthal has been appointed director of the bureau of social hygiene of the New York City Department of Health, succeeding Dr. Charles Walter Clarke, who returned to his former connection with the American Social Hygiene Association. Dr. Clarke was on leave from the association to organize and direct the health department's bureau.

Hospital News.—The cornerstone was laid recently for the Frances Schervier Hospital and Home for the Aged at Spuyten Duyvil in the Bronx. The new institution, run by the Sisters of the Poor of St. Francis, will accommodate 250 in the main building in semiprivate wards and there will be ninety-six private and semiprivate rooms in a wing. The hospital is named for Mother Frances Schervier, who founded the order in 1845 at Aachen, Germany.

Short Graduate Courses at Columbia.—Two series of courses for qualified graduates in medicine are to be offered by Columbia University at Mount Sinai Hospital, November 1 to December 24 and January 17 to March 12, 1938. Subjects to be covered include general medicine, cardiology, endocrinology, gastro-enterology, allergy, pediatrics, neurology and psychiatry, gynecology, ophthalmology, dermatology, proctology, radiography, otology, pathology, physical therapy and laboratory methods. Requests for information should be addressed to the Secretary for Medical Instruction, Mount Sinai Hospital, Fifth Avenue and 100th Street, New York.

NORTH CAROLINA

Division of Neurologic Surgery at Duke.—Dr. Maurice Barnes Woodhall, instructor in surgery, Johns Hopkins University School of Medicine, and a member of the surgical staff of Johns Hopkins Hospital, Baltimore, has been appointed assistant professor of surgery in charge of a new division of neurologic surgery in the surgical department of Duke University School of Medicine, Durham. Dr. Woodhall received his medical degree from Johns Hopkins in 1930.

Society News.— Dr. John H. Dougherty, Asheville, addressed the Buncombe County Medical Society, Asheville, August 16, on "Water Balance" and Dr. Dave M. Buck Jr. reported a case of sulfanilamide poisoning.——At a meeting of the Third District Medical Society, August 6, at Wrightsville Beach, the speakers were Drs. Charles L. Scudder, Boston, on "Fracture of the Two Weight-Bearing Bones—the Hip and the Os Calcis"; Oscar L. Miller, Charlotte, "Internal Fixation of Fracture of Hip"; James F. Robertson, Wilmington, "Review of Fractures Admitted for the Year 1936," and Richard Beverly Raney, Durham, "Demonstration Fracture Museum."——Drs. J. Standing Norman, Hickory, and Abner M. Cornwell, Lincolnton, among others, addressed the Catawba Valley Medical Society at Lincolnton, July 13, on "Congenital Atresia of the Nose" and "Treatment of Sciatica by the Injection of Novocain and Normal Sodium Chloride Solution into the Caudal Canal" respectively.

OHIO

Society News.—Dr. Perrin H. Long, Baltimore, addressed the Academy of Medicine of Cleveland, September 17, on "The Therapeutic Use of Sulfanilamide."——Dr. Alfred W. Adson, Rochester, Minn., will address the Youngstown Otolaryngological Club, September 29, on "Complications of Otitis Media and Frontal Sinusitis from a Neurologic Point of View."

Personal.—Dr. Warren C. Breidenbach, Dayton, has been appointed a member of the Ohio Public Health Council to succeed Dr. George D. Lummis, Middletown. Dr. Lummis has served since the council was created in 1917 to take the place of the state board of health.——Dr. Homer H. Williams, bacteriologist in the health department of Dayton since 1923, has been appointed health commissioner to succeed the late Dr. Arthur O. Peters.

Graduate Lectures in Lima.—A program of graduate lectures will be presented in Lima, September 20-24, with Dr. Carl V. Weller, Ann Arbor, Mich., as the speaker. The subjects will include constitutional types in relation to disease; developmental disturbances of the face, mouth and neck; pathology of coronary occlusive disease, the thyroid gland, the gallbladder and the kidneys; parasitic worms of the North Central states; endometriosis; Antony von Leeuwenhoek and his microscopes.

OREGON

Professor of Pharmacology Appointed.—Dr. Norman A. David, associate professor of pharmacology, University of Cincinnati College of Medicine, Cincinnati, has been appointed professor and head of the department of pharmacology at the University of Oregon Medical School, Portland, to succeed the late Dr. Harold B. Myers. Dr. David graduated from the University of California Medical School, San Francisco, in 1931 and was appointed assistant professor and head of the department of pharmacology at the University of West Virginia School of Medicine in 1932. He was appointed at Cincinnati in 1935.

PENNSYLVANIA

Society News.—The Lehigh County Medical Society held its annual picnic at the Lehigh Country Club, Allentown, August 10.——Dr. David M. Davis, Philadelphia, addressed the Harrisburg Academy of Medicine, September 21, on "Urinary Infections."——Dr. William L. Mullins, Pittsburgh, addressed the Cambria County Medical Society, Johnstown, September 9, on "Coronary Occlusion."

Pittsburgh

A Million for Diabetes Research.—A trust fund of a million dollars has been given to the Children's Hospital for "perpetual research in the causes, treatment and cure of diabetes in the youth of the Pittsburgh area," the Pittsburgh *Press* reported August 25. The donor is Miss Emily Renziehausen, who for many years cared for a brother with diabetes, according to the report. The first income of the fund will be used to build an addition to the hospital to be known as the Renziehausen Memorial Ward and Clinic. In addition Miss Renziehausen has given an eleven acre farm as a site for a home for convalescent children. The fund agreement provides that any income not needed for work on diabetes may be devoted to other research work and hospital service. Drs. Frederick E. Kredel, Richard A. Kredel and Thomas T. Sheppard were named as a committee to supervise the fund, of which the Union Trust Company is trustee.

TENNESSEE

Society News.— Drs. Leroy E. Coolidge and Robert S. Cowles, Greeneville, addressed the Greene County Medical Society, August 3, on differential diagnosis of acute abdominal pain and on treatment of scarlet fever, respectively.——At a meeting of the Hamilton County Medical Society, Chattanooga, August 5, the speakers were Drs. Jackson H. Barnett and Jonathan J. Armstrong, Chattanooga, on "Surgical Shock" and "Fluids Postoperatively" respectively.—— The Hardin, Lawrence, Lewis, Perry and Wayne Counties Medical Society met in Hohenwald, July 27, with the following speakers: Drs. Charles C. Stockard, Lawrenceburg, on "Postpartum Hemorrhage"; Duncan Eve Jr., Nashville, "Fractures"; James V. Hughes Jr., Savannah, "Ruptured Graafian Follicle," and William Battle Malone II, Memphis, "Early Management of Traumatic Injuries, with Special Reference to Highway Accidents."

University Opens Department of Preventive Medicine.—The University of Tennessee School of Medicine has established a department of preventive medicine to open October 1, with Dr. Frank L. Roberts, Trenton, in charge. The department will be jointly supported by the university, the state department of health and the Tennessee Valley Authority. Dr. Roberts will be full time professor of preventive medicine and Dr. Lloyd M. Graves, health officer of Memphis, associate professor. An associate professor of epidemiology will be added January 1, according to a newspaper report, and later an associate professor of sanitary engineering. Dr. Roberts, a graduate of the University of Minnesota Medical School, Minneapolis, in 1922, was health officer of Gibson County from 1924 to 1928, director of local health service in West Tennessee for the state health department from 1928 to 1930, and director of health demonstrations for the Commonwealth Fund in Gibson County since 1930.

TEXAS

Personal.—Dr. George T. McMahan, Burnet, has been named superintendent of a new hospital for mental disease to be built in West Texas.——Dr. Thomas J. McCamant, formerly health officer of El Paso and El Paso County, has been appointed health officer of San Antonio schools.——Dr. Thomas B. Wilson, Longview, has resigned as health officer of Gregg County to accept a similar position with the Corpus Christi-Nueces County health unit.——Dr. Gustav Mason Kahn, Galveston, has been named medical director of the American National Insurance Company, it is reported.

WEST VIRGINIA

Society News.—Dr. John F. Barker, Huntington, addressed the Cabell County Medical Society, August 12, on "Sulfanilamide Therapy in Urology."——At a meeting of the Central West Virginia Medical Society in Webster Springs, August 7, the speakers included Drs. John O. Rankin, Wheeling, on "Modern Treatment of Fracture of the Neck of the Femur" and William S. Fulton, Wheeling, president of the West Virginia Medical Association, on problems of the medical profession.——The Grant, Hardy, Hampshire, Mineral County Medical Society recently voted to change its name to the Potomac Valley Medical Society, which will also take in physicians of Pendleton County.——Dr. Rexford A. Burdette, Morgantown, addressed the Monongalia County Medical Society, Morgantown, August 3, on "Lower or Basal Lobe Tuberculosis."

GENERAL

Science Exhibit at Indianapolis.—The American Association for the Advancement of Science will present its annual science exhibition at the midwinter meeting in Indianapolis, December 27-30, at the Murat Theater. Application for space may be made to F. C. Brown, director of exhibits, American Association for the Advancement of Science, Smithsonian Institution, Washington, D. C.

Society News.—The seventh annual convention of the Biological Photographic Association will be held in Rochester, N. Y., at the Hotel Rochester, September 23-25.——The annual meeting of the American Academy of Orthopaedic Surgeons will be held in Los Angeles at the Hotel Biltmore, Jan. 16-20, 1938. For information write Robert Lewin, Hotel Biltmore, Los Angeles.——Dr. George W. Bowles, York, Pa., was chosen president-elect of the National Medical Association at its annual meeting in St. Louis in August. Dr. Lyndon M. Hill, Atlanta, was installed as president and Dr. William P. Dickerson, Newport News, Va., was elected vice president. Dr. John T. Givens, Norfolk, Va., was reelected general secretary. The 1938 meeting will be held at Hampton Institute, Hampton, Va.

Meeting of Railway Surgeons.—The forty-eighth annual Congress of Railway Surgeons will be held at the Palmer House, Chicago, September 20-22, under the presidency of Dr. William A. McMillan, Charleston, W. Va. Among the speakers will be:

Dr. Willis C. Campbell, Memphis, Tenn., Ununited Fractures of the Long Bones.
Dr. George W. Hall, Chicago, Treatment of Syphilis of the Nervous System.
Dr. William C. Stewart, Charleston, W. Va., Heart Disease as a Factor in Disability and Retirement.
Dr. Waltman Walters, Rochester, Minn., Treatment of Lesions of the Gallbladder and Bile Ducts.
Dr. Albert H. Montgomery, Chicago, Treatment of Burns.
Dr. Royd R. Sayers, U. S. Public Health Service, Syphilis as an Industrial Hazard.
Dr. Casper F. Hegner, Denver, The Advantage of Surgery in Pulmonary Tuberculosis.
Dr. Fred H. Albee, New York, The Importance of the Restoration of Blood Supply in Fracture of the Neck of the Femur.
Dr. William H. Stokes, Omaha, A Clinical Study of Retained Intra-Ocular Foreign Bodies, a Review of 300 Cases.

Sickness Increased in Industrial Employees in 1936.—The U. S. Public Health Service in a recent study of the incidence of illness in employees of twenty-nine industrial concerns found that in 1936 there were 95.1 cases of illness lasting eight days or more per thousand men, as compared with 85.7 in 1935. Most of the increase occurred in the fourth quarter of the year and was caused by diseases of the respiratory tract, especially bronchitis and pneumonia. The 1936 rate for this group of diseases exceeded that for 1935 by 17 per cent and the average for the preceding five years by 10 per cent. The incidence of pneumonia was a third higher in 1936 than the five year average; influenza in 1936 was 22 per cent higher than in 1935, but about the same as the five year average. In the final quarter of 1936 influenza was 80 per cent higher than for the last quarter of 1935; pneumonia, 20 per cent. The nonrespiratory diseases showed less variation than the respiratory group, but appendicitis showed a notable increase, from 3.8 per thousand in 1935 to 4.4 in 1936. For nonindustrial injuries the 1936 rate was 9 per cent above the frequency for 1935 but identical with the five year average. An exception to the general trend of increased illness was the tuberculosis rate, which declined from the 1935 incidence and from the average for the years 1931-1935. Other diseases that decreased in incidence were diseases of the nervous system, diseases of the heart and arteries and nephritis and all epidemic and endemic diseases except influenza.

Mississippi Valley Tuberculosis Meeting.—The twenty-second annual meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association will be held in Dayton, Ohio, September 22-25. The first day of the tuberculosis conference will be devoted to a "health education institute," with emphasis on school health programs. Thursday morning there will be discussions of seal sales and in the afternoon an administrative session. Friday the conference will meet with the sanatorium association and Saturday morning a meeting will be addressed by Dr. Jay Arthur Myers, Minneapolis, president of the National Tuberculosis Association, and Miss Fannie B. Shaw, New York, associate director of child health education of the national association. Speakers at the meeting of the sanatorium association include:

Drs. Charles K. Petter, Oak Terrace, Minn., and Gilbert J. Thomas, Minneapolis, Recent Advances in Our Conception of Renal Tuberculosis.
Dr. Ralph C. Matson, Portland, Ore., Closed Method of Intrapleural Pneumonolysis.
Dr. Horton R. Casparis, Nashville, Tenn., The Part Children Play in the Tuberculosis Problem.
Drs. George C. Turner and Loren L. Collins, Chicago, Pneumothorax in Minimal Tuberculosis.

Friday morning there will be a symposium on sanatorium administration, in which the participants will be Drs. Ernest S. Mariette, Oak Terrace, Minn.; Alexius M. Forster, Colorado Springs; David O. N. Lindberg, Decatur, Ill.; Harold M. Coon, Statesan, Wis.; James Burns Amberson Jr., New York, and Paul P. McCain, Sanatorium, N. C.

Committee Urges Instruction in Allergy.—The committee on instruction of the Association for the Study of Allergy recently made a survey of the instruction in allergic diseases in medical schools. Fifty-seven schools answered a question as to whether they had allergy clinics and, if so, how much they were used in teaching. Fourteen stated that they had none; seven of those that had clinics did not use them in teaching and four are used only for elective courses. Only about one fifth of the schools teach students how to make pollen or dust extracts, and in more than one third students are not taught how to administer extracts. In sixteen schools they are not taught how to make routine tests, and in seventeen they are not taught how to take allergic histories. Only seventeen offer elective courses to those who wish to learn more about the subject. Twenty-eight of fifty-two replies indicated that those schools had increased their instruction in allergy in the last five years. A study of the number of cases studied indicated that allergy cases represented 2.2 per cent of the total number of new cases and more than 5 per cent of the new medical, pediatric and dermatologic cases. Visits to clinics because of allergy amounted to 4 per cent of all visits and 9 per cent of all medical, pediatric and dermatologic cases. In a discussion of the information obtained in the study, the committee emphasized its belief that most physicians lack knowledge of allergic diseases, that too many physicians do not recognize allergic manifestations unless they are typical, that most of the information many physicians have is obtained from literature issued by commercial firms, and that the assignment of the teaching of allergic diseases to members of the faculty who do not have a deep interest in these diseases is undesirable. Four recommendations concluded the report: that the committee on curriculums of the Association of American Medical Colleges be

urged to require (*a*) that planned instruction be included in the curriculums of all medical schools, (*b*) that the minimum acceptable instruction include discussions of pathology, pathologic physiology, clinical manifestations, diagnostic methods, preparation of diagnostic and therapeutic extracts, history taking, principles of specific, symptomatic and nonspecific therapy, (*c*) that instruction be assigned to interested teachers, and (*d*) that such instruction be accorded the place in the curriculum that the incidence and severity of the diseases seem to justify.

FOREIGN

Prize for Work in Dermatology.—The French Society of Dermatology and Syphilology announces that an anonymous donor has made available a prize of 5,000 francs to be awarded every two years to the author of the best work, either printed or in manuscript form, on a subject in dermatology or syphilology representing a real advance in science. Every other time the prize will be awarded at a meeting of the society and the committee in charge will set the subject. The prize will be awarded for the first time at the general assembly of the society in May 1939 and the subject chosen is "The Processes of Sensitization and Immunization in the Epidermomycoses." Both French and foreign authors whose work has been written or translated into French are eligible to compete for the prize. Articles must be submitted to the secretary general, Dr. Pierre Fernet, 11 rue de Sontay, Paris (16), before Nov. 30, 1938.

Report of Nutrition Committee.—The League of Nations Mixed Committee on the Problem of Nutrition appointed in September 1935 now has issued a detailed report. The report urges governments to adopt a conscious nutrition policy by establishing national committees to ascertain food consumption habits and nutritional status in all sections of the population. Detailed evidence of malnutrition even in the most advanced countries is given in the report, which is intended to be used as a basis for a world nutrition policy during the next few years. The committee is made up of representatives of the Technical Commission of the Health Committee of the league, the International Labor Office and the International Institute of Agriculture. The United States was represented by Elmer V. McCollum, Ph.D., Baltimore; Edwin G. Nourse, Ph.D., of the Brookings Institution, Washington; Faith M. Williams, Ph.D., of the staff of the Department of Labor, Washington; Prof. Warren C. Waite, Minneapolis, and Harold B. Rowe of the staff of the Brookings Institution, Washington.

Government Services

Examinations for Government Positions

The U. S. Civil Service Commission announces examinations for positions in the U. S. Public Health Service (venereal disease control and industrial hygiene), in the Indian Medical Service in the United States and in Alaska, and in the Veterans' Administration. To become eligible, applicants must qualify in one of the following branches and must state in their applications the branch or branches desired: cardiology, cancer diagnosis and treatment, eye, ear, nose and throat (singly or combined), urology, internal medicine and diagnosis, neuropsychiatry, pathology and bacteriology, roentgenology, surgery (general, chest and orthopedic), tuberculosis, venereal disease, industrial medicine and general practice. Applicants must not have reached their thirty-fifth birthday on the date of the close of the receipt of applications and must be in sound physical health. Applications must be received by the commission at Washington not later than October 18 or, if from Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington or Wyoming, not later than October 21. Application forms may be obtained from the secretary, board of civil service examiners, at any first class post office, from the commission at Washington or from the district office in any of the following cities: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, T. H., Balboa Heights, C. Z., and San Juan, P. R.

CORRECTION

The Degree and Prevalence of Vitamin A Deficiency.—Dr. Harold Jeghers in his paper entitled "The Degree and Prevalence of Vitamin A Deficiency in Adults, with a Note on Its Experimental Production in Human Beings," in THE JOURNAL, September 4, page 760, erroneously included reference 18a. The paper to which this reference refers will not, Dr. Jeghers says, be published in the *New England Journal of Medicine.*

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 21, 1937.

The Danger of the Domestic Use of Gasoline

Cases are recorded from time to time of the burning to death of persons using gasoline for cleaning garments. The victims are quite unaware of any danger and may be at a distance from any fire or flame. The accident occurs in this way: Gasoline vapor, being much heavier than air, falls in a still atmosphere and will be drawn by a draft toward a fire. A flash back to the cleaning receptacle then occurs, with the inevitable fire and upsetting of the burning liquid over the clothes of the operator. Fire also may be started by static electricity caused by rubbing garments, especially silks, in the cleaning process. In one case a woman was burned to death while cleaning a garment in a garden and the fire could not be traced to any source. According to the annual report of the inspectors of explosives, thirteen accidents, causing three deaths, have occurred during the year. The comment is made that this is a very high proportion, as in the landing, storing, conveying and use in automobiles of 1,400 million gallons of gasoline in the year only twenty-five accidents, involving nine deaths, have been reported.

DANGEROUS AMATEUR FIREWORKS

The inspectors of explosives also point out the danger of amateur firework mixtures, which is due not only to their sensitiveness to friction but to the quickness and force of the explosion. A chlorate and phosphorus or sulfur mixture will explode with detonative violence, smashing up the mortar and blowing fingers off the hand of the operator. The inspectors found it necessary to send out a circular to manufacturers of chemical sets, warning them not to include these dangerous substances. In one case a schoolmaster mixed potassium chlorate and antimony sulfide in an envelop. He then added phosphorus, and while he was smoothing it over with a stick of chalk an explosion occurred which injured him so severely that three of his fingers had to be amputated. The science textbooks in use at the school were obtained and it was found that they gave details about these mixtures and also suggested other experiments with explosives. The matter was taken up with the publishers and also with the board of education. In 1936 three deaths and injuries to twenty-one persons occurred in the manufacture of explosives. The total accidents due to explosives in the year was 273. Several cases of illegal manufacture of explosives were brought to light by the occurrence of explosions.

The Surgical Treatment of Angina Pectoris

In his Carey Coombs memorial lecture, delivered at Bristol, Mr. Laurence F. O'Shaughnessy discussed the pathology and treatment of angina pectoris. He said that natural compensation for occlusion of the coronary tree may be effected in several ways: 1. Anastomoses between the right and left coronary arteries may come into action when one or the other main trunk is occluded. 2. The thebesian vessels (small channels which connect all four chambers of the heart with the venous and capillary bed of the coronary tree) may act as an additional source of cardiac nutrition. 3. The natural collateral channels which connect the coronary tree with the vasa vasorum of the great vessels may become more pronounced. 4. The heart may acquire a new and additional blood supply if it adheres to the parietal pericardium. The last important mechanism is available only in those rare cases in which the subject of coronary occlusion has previously suffered obliteration of his pericardial space as a result of old pericarditis, or when, following a coronary occlusion, an infarct is produced with its base on the

epicardial surface of the heart. In a special lecture delivered at the Royal College of Surgeons in January (The Journal, February 27, p. 738) Mr. O'Shaughnessy described the technic of his operation of cardio-omentopexy for the establishment of a collateral cardiac circulation and referred to three cases of angina pectoris or coronary thrombosis in which he had performed it. He now reported the following case:

A woman, aged 65, had suffered from angina pectoris for twelve years. The attacks became more frequent and more severe and she had been confined to bed for almost eighteen months. She was referred to the Lambeth Cardiovascular Clinic of the London County Council, of which Mr. O'Shaughnessy is consultant surgeon. On admission Oct. 1, 1936, she was obese. The heart was enlarged to the anterior axillary line. There were a soft aortic systolic murmur and a very short diastolic whiff. The blood pressure was 247 systolic, 117 diastolic. An electrocardiogram revealed complete bundle-branch block with large amplitude of QRS in leads 1 and 3. October 16, cardio-omentopexy was performed. At the end of the operation the pulse was 69 and the blood pressure 170/90. Recovery was interrupted by a paroxysm of auricular fibrillation, which began thirty hours after operation and ceased spontaneously nine and one-half hours later. Two anginal attacks occurred during the first fortnight but none subsequently. In six weeks the blood pressure returned to 240/112 and was causing symptoms. On a balanced diet it fell to 210/120. Physical signs of pulmonary collapse were present at the left base after the operation. The patient was able to get up and gradually increased her activities until she was able to climb stairs and go shopping. She had remained free from angina.

In his operations, Mr. O'Shaughnessy has found that the pericardium of man is often highly vascular compared with that of animals, perhaps because he has to develop his defenses against cardiac ischemia. Cardio-omentopexy not only brings a new blood supply into direct relation with the ischemic area and the coronary tree but also reinforces normal collaterals in the mediastinum. In the present state of our knowledge it is impossible to lay down any rigid indications for operation in cardiac ischemia. Experience at the Lambeth clinic has shown that it is practicable and comparatively safe, even under relatively unfavorable circumstances. Mr. O'Shaughnessy's patients have included a man of 72 as well as this bedridden woman of 65. He is not neglecting the obvious factor of arterial spasm in angina pectoris but maintains that spasm is significant only when coronary disease is already present. The medical staff of the clinic who select cases for operation includes Lord Dawson, president of the Royal College of Physicians, and only a small proportion of the patients sent to it are operated on. In the present stage of the work it is felt advisable to restrict intervention to the severe cases.

Epidemic of Poliomyelitis in Australia

Melbourne is suffering from a serious outbreak of acute poliomyelitis. Since the first cases were reported at the end of June, ninety-one children have been attacked and two adults, both of whom died. More than a hundred schools have been closed and special broadcasts are being given to mitigate the tedium for children, who are being kept at home for fear of infection. Country areas are demanding that children arriving from Melbourne be isolated, and Tasmania is making a similar stipulation.

Graduate Courses for Panel Physicians

The Ministry of Health is to make grants on a more extensive scale than heretofore to enable panel physicians to attend short courses of graduate study. The conditions under which a physician will be eligible for a grant are as follows: 1. Five years must have elapsed since the date of his first registrable qualification. 2. He must have not less than 300 (or in the case of a rural practitioner 150) insured persons on his list. 3. No grant will be payable to a practitioner more than once in five years. The grant will include a fee for the course, traveling and subsistence expenses, and the payment of a whole time locum tenens when necessary.

Professor J. G. Thomson

J. G. Thomson, professor of medical protozoology, London School of Hygiene and Tropical Medicine, has died. Educated at Edinburgh University, he gained the medals in botany and physiology and was prosector to the late Prof. D. J. Cunningham. He spent the first six years of his scientific career at Liverpool, where he held successive research scholarships. In 1914 he was appointed lecturer at the London School of Tropical Medicine, but during the war he was stationed in Egypt, where he specialized in pathology and protozoology at the Military Hospitals at Alexandria. On returning to England he was put in charge of the Malaria Research Laboratory at the War Office and in 1918 was appointed professor of medical protozoology at the newly opened School of Hygiene and Tropical Medicine. In 1926 he was exchange lecturer in protozoology at the School of Hygiene at Johns Hopkins University, Baltimore. In 1930 he was representative at the third International Congress on Malaria at Algiers, and in 1936 he gave at the request of the League of Nations Health Organization a series of lectures in the special course on malaria held at Singapore.

His work on the methods of enumerating malaria parasites in the blood and the study of cultural forms of the parasite are classic. His researches on blackwater fever in Rhodesia are most important, and his monograph on this disease is a standard work. He also did work on bilharziasis and other disease, when stationed in Egypt, which has advanced our knowledge. In his early days he traveled much in South America and in tropical countries, and this experience has given his work a special value. His direct approach to a subject and grasp of essential points with his common sense have contributed to the success of his writings.

PARIS

(From Our Regular Correspondent)

Aug. 21, 1937.

Fellows of Royal College Guests of Paris Academy

In accordance with an arrangement made in 1935 between the Royal College of Surgeons and the Académie de chirurgie to visit each other every year, the fellows of the former were received as guests here July 5 and 6. The French Académie de chirurgie visited England in 1936 as guests of the Royal College of Surgeons. About forty fellows of the latter, including Sir Cuthbert Wallace, the president, attended the Paris meeting. The program for the two day stay here included a visit to the Cancer Institute in one of the Parisian suburbs, operations and demonstrations at various hospitals, a dinner at the Hotel Ritz and a visit to the chateau of Chantilly. At a meeting held on the afternoon of the first day, an address of welcome was delivered by Dr. Baumgartner, president of the Académie de chirurgie, and papers were read by Professor Grégoire on intestinal infarct, by Professor Duval on postoperative pulmonary infarct, by Professor Mondor on uterine infarct, by Drs. Brocq and Warangot on hemorrhagic pancreatic infarcts and acute pancreatic necrosis, and by Professor Binet on surgical physiology. The afternoon of the second day was devoted to the celebration of the one hundredth anniversary of the birth of Prof. Felix Terrier. Following his address of welcome, the president of the Académie de chirurgie, Dr. Baumgartner, announced that the French government had authorized him to bestow the cross of Officer of the Legion of Honor on Sir Cuthbert Wallace, president of the Royal College of Surgeons, Mr. George E. Gask and Mr. Henry S. Souttar, presi-

dent and vice president respectively of the committee that has organized these annual meetings of the Royal College of Surgeons and the Académie de chirurgie.

Use of Toxoid in Staphylococcic Infections

Following the report at the June 9 meeting of the Académie de chirurgie of a case of staphylococcic infection with multiple localizations, including one in the epididymis, an active discussion took place as to the value of the toxoid in surgical cases. Dr. Rousset of Ploermel reported a case in which a man, aged 47, had a carbuncle of the neck, a perinephric abscess, a pulmonary focus and an epididymitis. No hemoculture had been made. All the various localizations, except the epididymal, were drained but the neck lesion presented such an atonic appearance that a series of injections of the staphylococcus toxoid was given every four days. After the first injection, the epididymal focus evacuated spontaneously. After a second injection, healthy looking granulation tissue appeared on the neck lesion. Complete recovery was rapid.

In the discussion, Dr. Moulonguet stated that Dr. Rousset had simply termed the case one of prolonged subacute staphylococcic infection instead of septicemia, because, although it had been impossible to have a blood culture made, staphylococci were found on several occasions in the urine. The atrium of infection had undoubtedly been the carbuncle on the back of the neck, which persisted in an indolent form for more than six months. Moulonguet agreed with Rousset that the staphylococcus toxoid was responsible for the healing of the carbuncle which had continued as a primary focus. In looking over the reports by French surgeons as to the value of the toxoid, five cases of severe septicemia (staphylococcus) confirmed by blood cultures, were found. As to the mode of administration, a minute initial dose, 0.1 cc., should be given to test the sensibility of the patient. If no reaction occurs, the dose can be gradually increased from 0.25 cc. to 2 cc. Not more than five injections should ever be given. Pagniez had observed a severe shock with pallor, epileptiform movements and loss of consciousness after the eleventh injection. In spite of an absence of any toxic action in animals, the toxoid can give rise to serious reactions clinically. Although our knowledge as to how the toxoid cures certain cases of staphylococcic septicemia is still imperfect, we do know that the Ramon toxoid is a valuable agent in certain apparently hopeless cases.

Dr. Sauvé believed that the variation in the results following the use of the toxoid were due to the existence of many different strains of staphylococci. He also questioned the permanence of the recovery in the case reported by Dr. Rousset. In three of his own cases, recurrence in one had been observed after apparent recovery, two years later. A third consideration is that in the cases reported by Gastinel and Reilly the first hemoculture was positive but later ones were not. He considered Dr. Rousset's case one of true staphylococcic septicemia in spite of the absence of a blood culture. Dr. Leveuf said that he was skeptical regarding the efficacy of the toxoid in staphylococcic infections. He did not agree with Dr. Moulonguet as to the benefit of giving the toxoid in the case under discussion. Dr. Monod recalled Nicolle's definition of a septicemia as including not only the presence of bacteria in the blood stream but also their constant multiplication there. Dr. Bazy believed that the staphylococcus antitoxin content of the blood ought to be estimated in every case in which the toxoid is used. Dr. Sauvé, in reply to Dr. Monod, said that he agreed with him as to the interpretation of negative cultures. The discharge of bacteria into the blood stream is intermittent in cases of septicemia; hence a blood culture may be negative at one examination and positive at another. In closing the discussion, Dr. Moulonguet, who had presented the case for Dr. Rousset, maintained that the toxoid was clearly responsible for the recovery in this severe staphylococcic infection.

Report on Magnesium Alloy Bone Splints

At the June 16 meeting of the Académie de chirurgie, a critical analysis of a monograph on magnesium splints in fractures, by Dr. Verbrugge of Antwerp, Belgium, was read by Dr. Menegaux of Paris, to whom the monograph had been assigned for review. As justification for the use of absorbable bone splints, Dr. Verbrugge cited the fact that not only was it necessary to remove steel-vanadium splints in 6 per cent of the cases in Lambotte's service but such an operation is very difficult and at times impossible to carry out. In addition, in children, such splints when placed near the epiphysis interfere with bone growth. Splints of magnesium alone were not found sufficiently resistant, so a splint composed of 92 per cent magnesium, 8 per cent aluminum and a small amount of manganese was employed. In five rabbits and one dog, the upper end of the tibia was splinted. Gross examination at variable periods revealed only a moderate periosteal and cortical thickening, and medullary condensation. The splint was then used in thirty-five clinical cases, in thirty-one of which healing occurred by primary union and in four following fistula formation of short duration. There is a local elevation of temperature and a zone of hydrogen gas formation (as seen radiographically), at first subperiosteal and later intraosseous. In twenty-five cases there was no abnormal degree of osteoperiosteal reaction and consolidation was present at the end of four weeks. In seven cases, nearly all fractures of the tibia, the results were unsatisfactory because of inadequate fixation of the splint and consequent imperfect immobilization and excessive callus formation. In six fractures near joints the splint did not interfere with movement. In fifteen epiphysial or juxta-epiphysial fractures the metal was rapidly absorbed and did not retard bone growth.

In a second series of animal experiments, the tibia of ten rabbits was splinted with the Dow metal (magnesium-aluminum) and ten other control rabbits with a thin steel splint. The latter did not give rise to any reaction, whereas the Dow metal splint caused important reactions strictly localized around the splint in the form of bone resorption and periosteal thickening. In commenting on the results of Verbrugge's experimental work, the reviewer, Menegaux, criticized the lack of microscopic examination of the first rabbit series and that, in the clinical cases, the majority were of the epiphysial variety with but little displacement. The local reactions, such as gas and fistula formation, were also objectionable from the surgical standpoint.

Unfavorable results, such as sequestration of a large area of the cortical portion of the tibia, were reported by Bérard and Creyssel in 1935, following the use of a resorbable magnesium alloy splint. Other reports were cited by Menegaux, showing that magnesium is more toxic than gold, iron, nickel and silver and less so than copper and aluminum. Menegaux believed that it was inadvisable to employ splints of magnesium and its alloys. The use of inoxidizable steel bone splints is being generally adopted, according to various recent reports.

Acute Pulmonary Tuberculosis in Adolescents

At the June 11 meeting of the Société médicale des hôpitaux, two cases were reported by Troisier, Bariéty and Nico, which show that even after candidates for admission to universities or nursing schools have passed a thorough physical examination, including an epidermal tuberculin test, they can develop an acute adult form of tuberculosis when their environment changes from that of rural districts to that of a large city. Both patients were young women in whom the roentgenographic examination of the lungs and the epidermal tuberculin test had been negative when they were admitted respectively to the University of Paris and to the school for nurses of a large Paris hospital. One died of a tuberculous meningitis following an acute ulcerocaseous type of pulmonary tuberculosis without preceding mediastinal adenopathy. The other died as the direct

result of the pulmonary infection. In both, the epidermal tuberculin test, previously negative, became positive. In the discussion, Rist said that such cases would be seen more often in the future in proportion to the increased use of the tuberculin reaction in adults. There would also be less difference between the roentgenographic appearance of lesions due to primary infection and that due to reinfection. He reported the case of a young woman with a negative epidermal reaction who had come from the country districts to enter the school of nursing in one of the Paris children's hospitals. A month after she began ward service, evidences of pulmonary tuberculosis appeared. The epidermal tuberculin reaction, previously negative, suddenly became positive, ten weeks after she began her nursing work. Not infrequently the clinical picture was similar to that of an attack of influenza at the onset, as in the cases reported by Troisier. Etienne Bernard said that he had seen acute pulmonary tuberculous lesions in young adults, which appeared to be primary infections. At the present time, based on the roentgenographic appearances, one cannot distinguish between such primary infections and reinfections.

BERLIN

(From Our Regular Correspondent)

Aug. 16, 1937.

Influence of Milk on Growth and Metabolism

The question of what influence the heating process exerts on homologous and on heterologous milk has been repeatedly studied but there has been no unanimity of opinion on the subject. Catel, professor of pediatrics at Leipzig, recently undertook a clinical and experimental investigation of this problem. From feeding experiments of short and long duration with homologous milk, two principal observations were elicited: 1. By sterilization of homologous milk the natural immunity of human and animal nurslings is reduced, a circumstance made manifest by increased morbidity and mortality. 2. A diet of sterilized homologous milk leads to obvious impairment of growth, under certain conditions to complete arrest of growth. For example, following the feeding of premature infants with raw mother's milk sterilized at the nursery, a decline in the rate of growth ranging from 14 to 77 per cent with a mean of 44 per cent was observed. Accordingly, raw homologous milk attains a higher nutritive value than heated milk. (By nutritive value is meant, according to Friedberger, simply the utilization of the nutriment in relation to the preparatory, that is to say, the warming, process. This utilization finds expression in the curves of weight and growth). Further experiments and calculations (which concerned the use of raw and of autoclaved goat's milk in the rearing of young goats) showed that the utilization value of raw milk is from three to ten times greater than that of autoclaved milk. Since it seemed logical to seek the cause of this impairment of growth following heated milk diet in a disturbed metabolism, metabolic experiments were performed with goats. It was observed that (1) the nitrogen balance remains positive but the absorption of nitrogen is plainly reduced; (2) radical changes take place in the mineral metabolism (marked storage of chlorine, negative calcium balance, manifest diminution of the phosphorus balance) and also in the blood serum and in the bony tissues the calcium and phosphorus values were reduced. It is possible by the addition of substances containing vitamins to effect a resumption of growth and completely to normalize the metabolism. The briefer feeding experiments with heterologous milk in both the raw and the heated states disclosed that after placing goats on a diet of sterilized cow's milk the increases in weight were greater than after feeding with raw milk. On the other hand the injurious effects of the sterilized milk were plainly perceptible in an increased susceptibility to illness, notably diarrhea and in several instances a fatal tetany. Feedings of autoclaved cow's milk generally resulted in complete arrest of growth and death from cachexia within a matter of days, weeks or months. By proper addition of even the most minute quantities of vitamin-containing substances it was in most instances possible to compensate for the disturbances of growth.

The general implication of the foregoing experimentation for human physiology is that human milk in particular ought to be fed the nursling only in the raw state. If human milk is preserved for storage in depots, it should be submitted to only such a process as will in no way impair its natural character. A method of brief heating appears to offer the most plausible solution of a problem that is of major importance from both a clinical and a social point of view.

Contagious Diseases and Aviation

Recently for the first time the minister of the interior and of aviation has issued regulations designed to combat the spread of contagious disease by aerial navigation. The airport medical officer is authorized, if circumstances so warrant, to conduct a medical inspection of the passengers and crew of an aircraft both before the takeoff and after the landing. To avoid needless delays, these medical inspections are to be carried on in conjunction with the usual administrative formalities (customs inspection and so on). Excluded from ordinary air travel are all persons affected with cholera, typhus, plague or smallpox, as well as all persons suspected of harboring any of these diseases. Travelers who come under this ban may be permitted by the medical officer to continue on in a special plane. Persons suspected of transporting infections as well as bacillus carriers and continuous disseminators of bacteria also can be excluded from flight. Quarantine measures also have been made more strict. Letters and other paper matter are not subjected to any sanitary inspection, and parcel post and other mailed packages are inspected by the medical officers only if such material has been shipped from a region of endemic cholera and if it consists of fresh foodstuffs. If special epidemiologic conditions exist, aircraft may be assigned to special landing fields. The pilot of the plane should furnish any information on the hygienic conditions that may be requested of him. In order to prevent the spread of other communicable diseases the authorities of each airport have the right, on the basis of the professional opinion of the medical officer, to forbid the takeoff of any persons who present symptoms of the mentioned diseases. If no physician is present, the airport official can postpone the departure of a suspected person till such time as a medical opinion on his condition can be formulated.

VIENNA

(From Our Regular Correspondent)

July 31, 1937.

Congress of Roentgenologists

During the second week of July the second congress of the Austrian Society of Roentgenology met in Vienna with Professor Dr. Kienböck the presiding officer. There were 720 Austrian specialists as well as some 300 foreign colleagues who were attracted to Vienna by the first Short Wave Congress, which was to follow the meeting of the Austrian society. The congress began with the usual formalities. Minister Resch of the national bureau of health acted as official governmental representative, and the government made a further contribution to the congress by honoring the founder of roentgen therapy, Prof. Dr. Leopold Freund, with the high title of "Hofrat" for his many services.

The more important themes were (1) early diagnosis by means of roentgen and infraroentgen rays and (2) roentgen therapy of inflammation. A summary of the principal speakers and their topics follows: Dr. Lenk discussed "tomography," a new diagnostic technic based on cross sectional representation of the body in layers. Dr. Blühbaum of Cracow described inflammations of the cervical portion of the vertebral column, which often

give rise to severe neuralgias in the region of the brachial plexus. These conditions are first diagnosed by means of x-ray visualization; sciatica is prominent among them. Professor Sgalitzer stressed the great difficulty encountered by the roentgenologist in differential diagnosis of inflammatory and tumorous processes of the internal organs. Only after observations and comparisons with the clinical data have been repeated over a considerable period can a correct diagnosis be established. This is especially true of disease processes in the intestine, lungs and brain. In many instances the inflammation can be obliterated by simple roentgen irradiation and a previously undetected coexistent neoplasm becomes plainly discernible.

Dr. Fleischner, docent, discussed the x-ray visualization of pulmonary alterations which may appear in the vicinity of tuberculous foci. It is known that these processes are not necessarily tuberculous but may be only secondary sequels of the primary manifestations. Dr. Herrnheiser of Prague discussed the same theme. In recent years, he said, it has been established that in the study of shadows in the hilus pulmonis more diagnostic significance attaches to the structure than to the size and shape. The foregoing factors are most important in the diagnosis of childhood tuberculosis, which is frequently localized in the hilus. Dr. Kautsky spoke on bronchography, a technic which he finds especially valuable for the diagnosis and therapy of bronchiectasis. Of interest was the report of Ruckensteiner of Innsbruck on the x-ray visualization of dilatation and diverticulum in the region of the esophagus.

L. Strauss, engineer, demonstrated a new apparatus which he calls the "telecord," by means of which each cardiac phase can be photographed in sequence. The device can be attached to any x-ray apparatus.

Dr. Zdansky spoke on the differential diagnosis of gastric carcinoma as opposed to catarrhal or ulcerous gastritis. Observations over a period of years of cancer in which cure has been effected attest the importance of diagnosis in the early or precancerous state. Drs. Presser and Pape emphasized that not infrequently the discrepancy between the clinical observations and the x-ray observations is decided in favor of the roentgenologist only by surgical operation. Dr. Altschul of Prague discussed the limits of x-ray diagnosis of bone disease. The time at which examination takes place is important, as in the initial stages bone disease is but rarely demonstrable by x-rays. The early diagnosis of head injuries was discussed by Professor Schüller. Despite positive determinations (foreign bodies within the cranium, bone fractures and so on) the initial subjective symptoms are as often as not quite slight and therefore misleading. Such patients stand in grave danger unless submitted to x-ray examination. In severe traumas of the head the portable apparatus is most serviceable. Dr. E. G. Mayer stressed the importance of roentgenography in disorders of the mastoid and pyramidal processes.

Dr. Leb of Graz discussed the early diagnosis of gallbladder disease. Formerly a cholecystitis was assumed if the gallbladder was not filled by the contrast medium. The author has, however, in more than 200 cases introduced the contrast fluid by intravenous injection (not orally, as is customary). He was able, by means of this more exact technic, to detect inflammatory lesions in the gallbladder when the shadows of the organ appeared normal in other types of visualization.

The second principal theme was roentgen therapy of inflammations. The leading paper was read by Dr. Wieser. Professor Freund stressed the marvelous prophylactic influence of roentgen irradiation on recurrent inflammations. Professor Dr. Wintz discussed the roentgen therapy of inflammatory disorders of the female genitalia. There are virtually but two types of procedures: irradiation of the foci of inflammation proper with small doses and irradiation of the ovaries with larger doses. The last named procedure induces a dormancy in ovarian function (temporary castration) and secondarily a recession of the inflammatory process. In acute mastitis the inflammation can be brought to cure through a roentgen-produced dormancy of lactation. The observations of Professor Wintz were verified by those of Dr. Gajzágó of Budapest, who had achieved similar successes in the treatment of phlebites.

Dr. Palugyay of Vienna has observed favorable results of roentgen irradiation in osteomyelitis. In its early stages the disease can be cut short and quickly eradicated by mild dosage. In the advanced stages mild doses are ineffectual; larger doses, however, induce a quicker casting off of sequestrums. In paronychia, too, in the simple as well as in the osseous and articular forms, one can, according to Dr. Spitzenberger, attain results by roentgen therapy that compare favorably and may even be superior to those obtained by surgery. The roentgen therapy of disturbances due to spur formation on the soles of the feet was highly recommended. Although irradiation does not cause the spur to disappear, it heals the inflammatory processes for which the spur is responsible.

Windholz advocated roentgen therapy in chronic tonsillitis. Although the rays do not effect a total obliteration of the tonsils as in tonsillectomy, they do lead to satisfactory and seemingly permanent results. This observation was corroborated by Frank, who treats tonsillar abscesses solely with roentgen rays.

Dr. Hammer particularly recommends roentgen therapy in neuritis and neuralgia. It is more effective than any other type of treatment for these disorders. The influence on inflamed nervous tissues seems to be specific.

Even this brief enumeration of the most important papers shows how this congress, although planned as a small, local Austrian affair, came to assume an international complexion through the presence of so many prominent roentgenologists from Germany, Italy, Czechoslovakia, Hungary and Poland.

ITALY

(From Our Regular Correspondent)

July 30, 1937.

Society Meetings

At a meeting of the Accademia medico-fisica of Florence recently Professor Focosi reported four cases of metallic foreign bodies lodged in the posterior segment of the eye. The anterior segment was normal and the refractive media were transparent. The foreign bodies in all cases were removed through the sclera by means of Volkmann's giant electromagnet. The localization of the metallic particles was determined by ophthalmoscopic or x-ray examination of the eye. The scleral incision was proportional to the size of the body, to prevent injuring the choroid. The operation gave satisfactory results in all cases. The speaker concluded that the removal of foreign bodies through the sclera is a procedure which is preferable to that of removing them through the anterior chamber.

Professor Volterra said that the methods actually used for determining the aromatic substances of the blood do not give satisfactory results. The colorimetric reactions, done on the blood deprived of proteins, result in the determination of many aromatic substances of phenolic nucleus aside from that of the phenols in the blood. The reaction is nonspecific, especially because of the presence of amidols. Distillates, obtained by indirect distillation in a steam current, contain also substances that disturb the reaction. Better results are obtained by resorting to the xanthoproteic reaction of Parenti and Pekelis, with slight modifications. Normal blood contains free and conjugated phenols in a noticeable amount. An exact chemical determination as to the amount of phenols in the blood cannot be made by any method. The method described and used by Volterra, however, gives clinically satisfactory results in studying the metabolism of aromatic substances.

The gruppo cardiologico italiano met recently in the hall of the Clinica medica of the Milan University to discuss chronic myocarditis. Professor Condorelli discussed this subject from

a clinical point of view. He criticized the modern opinions of those who regard chronic myocarditis as a syndrome of circulatory insufficiency or due to extramyocardial heart diseases. There is no doubt that the myocardium may be involved in both pathologic conditions and that the diagnosis of the conditions of the myocardium in circulatory insufficiency or extramyocardial heart diseases is of great importance. Chronic myocarditis, however, is a myocardial disease of chronic evolution independent of circulatory insufficiency. The specific agent of rheumatism frequently involves the cardiac muscle diffusely. Nonspecific myocardial lesions, such as degeneration and myofibrosis, are caused either by coexisting rheumatic coronaritis or by atheroma of the coronary arteries, which may complicate the disease. In the diagnosis of the conditions of the myocardium of patients suffering from hypertension, the presence of hypertrophy is a sign of importance in showing a diminished functional capacity of the heart. Besides the physical symptoms and x-ray signs, the alterations of the electrocardiogram, especially of the S and ST deflections, are of diagnostic value. The disturbances of atrioventricular conduction show ischemic lesions of the bundle of His from coronary sclerosis. The speaker stated that the clinical diagnosis of myocardial sclerosis can be made early in the development of the disease, before establishment of the phenomena of decompensation, and can be followed by an early treatment of the disease.

Dr. Caporali, in a lecture before the Turin Società di Chirurgia, spoke on the surgical treatment of impotence. His operation for impotence is done by the following technic: spinal or sacral anesthesia, incision of the skin at the back of the penis, passage of a nontraumatic needle carrying a thread of catgut from one to the other cavernous body, moderate traction of both ends of the catgut and knotting in order to have the dorsal vein of the penis compressed. The patient is placed in the jackknife position, a urethral sound of Benique's type is passed into the urethra, the incision starts at a point 10 cm. from the anal margin, and after a course of 5 cm. it is bifurcated to form an inverted Y. By this incision one approaches the spongy body, which is covered by the bulbocavernosus muscle, at the end of which the ischiocavernosus muscle is located. With a nontraumatic needle threaded with catgut the ischiocavernosus muscles of both sides are approximated in front of the bulbocavernosus muscle, to make local compression. The bulbocavernosus muscles are also approximated by the same technic. Because of the fact that the nerve supply of the region is abundant, the operation has to be carefully done to prevent injuring the nerves.

Marriages

DONALD WILLIAM FAWCETT, Starkweather, N. D., to Miss Rosemary Barbara Tallent of Menominee, Mich., June 26.

GEORGE EDWARD HALL, Toronto, Ont., Canada, to Miss Lola Ruth McDonald of Bronxville, N. Y., June 26.

ANDREW MARSHALL JAMISON JR., Spartanburg, S. C., to Miss Amelia Albergotti of Orangeburg, June 5.

WILLIAM LESLIE HEITER, Mobile, Ala., to Miss Elizabeth Agnes Manson of Jacksonville, Fla., June 2.

NICHOLAS LUCIA, Braidwood, Ill., to Miss Elizabeth J. Yeats of York, Pa., at Collegeville, Pa., June 6.

ARCHIBALD R. JUDD, Glen Gardner, N. J., to DR. MARGARET DILL MILLER of Philadelphia, July 16.

JOSEPH L. LILIENTHAL JR., New York, to Miss Katherine Arnstein of San Francisco, June 25.

ALEXANDER O. BIRGERSON, Chicago, to Miss Eleanor B. Mueller of Hinsdale, Ill., July 31.

HARLEY A. HAYNES, Ann Arbor, Mich., to Mrs. Grace Lyons at Ionia, July 3.

HENRY N. HARKINS, Chicago, to Miss Jean Trester of Hobart, Ind., June 19.

Deaths

Arthur Walters Rogers ⊕ Oconomowoc, Wis.; Rush Medical College, Chicago, 1895; past president of the Waukesha County Medical Society and the Milwaukee Academy of Medicine; in 1927 president and for many years chairman of the council of the State Medical Society of Wisconsin, and in 1934 awarded the gold seal of the society; member of the American Psychiatric Association and the Central Neuropsychiatric Association; for many years director and owner of the Oconomowoc Health Resort, now known as the Rogers Memorial Sanitarium, of which he was physician in charge; aged 67; died, August 27, of coronary occlusion.

Harry Ver Brike Brown ⊕ Glendale, Calif.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1902; formerly vice president of the Los Angeles County Medical Association and past president of the Glendale Branch; member of the state board of medical examiners; for many years a member of the board of trustees of the Glendale Union High School District, acting as president for one term, and also served as a member of the board of trustees of the Glendale Public Library; aged 62; died, June 25.

John Thomas Joseph Bird, Los Angeles; University of the City of New York Medical Department, 1886; member of the Medical Society of the State of New York; formerly clinical professor of medicine at the New York University College of Medicine; aged 76; died, June 26, in the Hospital of the Good Samaritan, as the result of an injury received in a fall while at Yosemite National Park, Calif.

Harry Gilmer Walcott ⊕ Dallas, Texas; Baltimore Medical College, 1901; fellow of the American College of Physicians; emeritus professor of gastro-enterology at the Baylor University College of Medicine; associate professor of physiologic chemistry at his alma mater, 1901-1902; served during the World War; aged 58; died, June 2, in the Medical Arts Hospital.

George Womock Sitman, Baton Rouge, La.; Tulane University of Louisiana Medical Department, New Orleans, 1892; member of the Louisiana State Medical Society; parish health officer; medical superintendent of the Greenwell Springs (La.) Sanatorium; aged 67; died, June 16, in Roseland, of chronic interstitial nephritis, pneumonia and arteriosclerosis.

R. E. Lee Smith, Doyle, Tenn.; University of Tennessee Medical Department, 1886; member of the Tennessee State Medical Association; past president of the Knox County Medical Society; formerly superintendent of the Eastern State Hospital, Knoxville; aged 72; died, June 7, in the Knoxville (Tenn.) General Hospital.

Herbert Spencer Van Kirk, McKeesport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; past president of the city board of health; on the staff of the McKeesport Hospital; aged 61; died suddenly, June 6, of coronary thrombosis.

Benjamin Thane, Wahpeton, N. D.; University of Minnesota Medical School, Minneapolis, 1917; member of the North Dakota State Medical Association; served during the World War; health officer; contract physician to the Wahpeton Indian School Hospital; aged 50; was electrocuted by his own x-ray machine, June 17.

Reginald Malcolm Ballantyne, Manlius, N. Y.; Syracuse University College of Medicine, 1913; physician to the county penitentiary; served during the World War; past president of the board of education; aged 49; died, June 30, when the automobile in which he was driving was struck by a trolley car.

Julian L. De Loney, Detroit; Meharry Medical College, Nashville, Tenn., 1905; member of the Michigan State Medical Society; formerly professor of internal medicine at the University of West Tennessee College of Medicine and Surgery, Memphis; aged 55; was shot and killed, June 24, by a patient.

George Coleman Skinner, Washington, D. C.; Rush Medical College, Chicago, 1894; formerly surgeon in the U. S. Public Health Service reserve, and later connected with the Veterans Administration; served during the World War; aged 67; died, June 21, in the Veterans Administration Facility.

George Edward Smith, Fredonia, N. Y.; University of Buffalo School of Medicine, 1886; member of the Medical Society of the State of New York; past president of the Chautauqua County Medical Society; formerly coroner; aged 74; died, June 18, of myocarditis and cerebral hemorrhage.

Charles Oscar Caswell, Portland, Maine; Medical School of Maine, Portland, 1900; member of the Maine Medical

Association; for many years head of the science department of the city high school; aged 70; died, June 22, of cerebral hemorrhage and hypertensive heart disease.

Henry Ansel Vincent, Wellington, Kan.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; member of the Kansas Medical Society; served during the World War; aged 61; died suddenly, June 9, of acute dilatation of the heart.

Florence Augusta Sherman, Albany, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1891; formerly assistant state medical inspector for the state department of education; aged 76; died, June 20, in Watertown, of nephritis.

Lloyd Charles Lane ✠ Oklahoma City; University of Oklahoma School of Medicine, Oklahoma City, 1929; aged 32; on the staffs of the Oklahoma City General Hospital, Wesley Hospital and St. Anthony Hospital, where he died, June 28, of a sinus infection.

Orrin Hays Swayze ✠ Yazoo City, Miss.; Tulane University of Louisiana Medical Department, New Orleans, 1893; formerly county health officer; for many years member of the board of trustees of the city schools; aged 66; died, June 13, of cerebral arteriosclerosis.

Vaughan Le Roy Sprenkel ✠ Allentown, Pa.; Jefferson Medical College of Philadelphia, 1931; on the staff of the Sacred Heart Hospital; aged 31; died, June 18, in the Jefferson Hospital, Philadelphia, of cerebral hemorrhage and thrombocytopenic purpura.

William James Shaw, Rome, Ga.; Atlanta Medical College, 1895; member of the Medical Association of Georgia; past president of the Floyd County Medical Society; on the staff of the Harbin Hospital; aged 69; died, June 21, of chronic myocarditis.

George Dalton, Malden, Mo.; Missouri Medical College, St. Louis, 1889; member of the Missouri State Medical Association; aged 84; died, June 24, in a hospital at Little Rock, Ark., of hemorrhage of the stomach and carcinoma of the pancreas.

Frank Pierce Gray, San Francisco; Cooper Medical College, San Francisco, 1895; member of the California Medical Association; formerly assistant professor of diseases of women and children at his alma mater; aged 84; died, June 28.

William Riley Parker, Dixon, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the Illinois State Medical Society; died, June 25, in a local hospital, of cerebral hemorrhage.

Edwin Clyde Ramer, Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1928; member of the Tennessee State Medical Association; aged 35; died, June 29, in the Methodist Hospital, of cerebral hemorrhage.

Frances Wason Potter, Medford, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; member of the Massachusetts Medical Society; aged 82; died, June 24, of arteriosclerosis and cerebral hemorrhage.

Everette Lewis Powell, Farrsville, Texas; University of Louisville (Ky.) Medical Department, 1902; St. Louis College of Physicians and Surgeons, 1904; aged 62; died, June 24, in the John Sealy Hospital, Galveston.

William N. Spohn, Brownsville, Texas; Kentucky School of Medicine, Louisville, 1897; member of the State Medical Association of Texas; aged 67; died, June 10, in the Mercy Hospital, of gastric hemorrhage.

John Newton De Shazo, Center Cross, Va.; Medical College of Virginia, Richmond, 1900; member of the Medical Society of Virginia; member of the county board of supervisors; aged 61; died, June 26.

William Cecil Burnaman, Washington, Kan.; Lincoln Medical College of Cotner University, 1908; member of the Kansas Medical Society; county coroner; aged 52; died, June 23, of coronary thrombosis.

Alonzo L. Carpenter, Joplin, Mo.; University Medical College of Kansas City, 1897; formerly city physician; aged 68; died, June 25, in the Freeman Hospital, of injuries received in an automobile accident.

Mary Augusta Camp, Red Hook, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1893; aged 80; died, June 17, of chronic nephritis and myocarditis.

Nathaniel Van Wert Wright, Baltimore; Baltimore University School of Medicine, 1901; Southern Homeopathic Medical College, Baltimore, 1902; aged 59; died suddenly, June 19, in Lewes, Del.

James T. Tipton, Mountain Home, Ark.; Memphis (Tenn.) Hospital Medical College, 1891; member of the Arkansas Medical Society; aged 72; died, June 4, of heart disease and cirrhosis of the liver.

Joseph Vanden Berg, New York; Columbia University College of Physicians and Surgeons, New York, 1904; member of the Medical Society of the State of New York; aged 60; died, June 23.

Herbert Wilson Long ✠ Newark, N. J.; Bellevue Hospital Medical College, New York, 1894; on the staff of St. Michael's Hospital; aged 65; died, June 10, of cerebral embolism.

Edward Everett Collins, Premont, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; served during the World War; aged 76; died, June 28, in a hospital at Legion.

Franklin De Wight Ayers ✠ Sabula, Iowa; Baltimore University School of Medicine, 1892; aged 70; died, June 23, of chronic myocarditis, cholecystitis and prostatic hypertrophy.

Clinton Quincy Dodd, Santa Monica, Calif.; John A. Creighton Medical College, Omaha, 1910; member of the Nebraska State Medical Association; aged 49; died recently.

William H. Steele, Griffin, Ga.; Atlanta College of Physicians and Surgeons, 1900; member of the Medical Association of Georgia; aged 67; died, June 23, of cerebral hemorrhage.

Albert Marion Hoyer, Akron, Ohio; Starling Medical College, Columbus, 1891; aged 79; died, June 28, in the City Hospital, of pyelonephritis and prostatic hypertrophy.

St. Elmo Davenport, Atlantic City, N. J.; College of Physicians and Surgeons, Boston, 1908; school and city physician; aged 58; died, June 28, of mitral regurgitation.

Jeremiah Maher, Los Angeles; Rush Medical College, Chicago, 1882; past president of the Alameda County Medical Society; aged 88; died, June 14, of arteriosclerosis.

Fletcher F. Craig, Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Texas Christian University, 1909; aged 53; died, June 28, of nephritis.

Robert Bates Hunt, Boston; Harvard University Medical School, Boston, 1912; served during the World War; aged 51; died, June 22, in the Faulkner Hospital.

William Florence Sheridan, Pittsburgh; Jefferson Medical College of Philadelphia, 1871; aged 89; died, June 3, of myocarditis and essential hypertension.

Frank Guy Blanchard, Woodville, Ohio; Western Reserve University Medical Department, Cleveland, 1888; aged 77; died, June 26, of coronary thrombosis.

Amos Huram Winslow, Toledo, Ohio; University of Michigan Homeopathic Medical School, Ann Arbor, 1879; aged 84; died, June 14, in a local hospital.

William Alonzo De May, Fort Collins, Colo.; Kansas City (Mo.) Medical College, 1891; aged 80; died, June 22, of diabetes mellitus and pneumonia.

Charles Russell Smith ✠ Tioga, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; aged 66; died, June 1, of lobar pneumonia.

Walter M. Boylan, Boyne City, Mich.; Michigan College of Medicine and Surgery, Detroit, 1900; aged 65; died, June 24, of bronchopneumonia.

Amos Leuty, Morris, Minn.; Drake University Medical Department, Des Moines, Iowa, 1898; aged 68; died, June 24, of coronary thrombosis.

George Millard Clifton ✠ Norman, Okla.; Metropolitan Medical College, Chicago, 1900; aged 60; died, June 22, of coronary thrombosis.

Walter Livingston Coulthard, Vancouver, B. C., Canada; University of Toronto (Ont.) Faculty of Medicine, 1894; aged 64; died, June 6.

William Ernest Borley, Mishawaka, Ind.; Detroit College of Medicine, 1894; aged 67; died, June 21, of heart disease at Twelve Mile.

Thomas Wellesley Peart, Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, 1909; aged 48; died, June 4.

William Thomas Burns, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1900; aged 63; died, June 3.

Jerome Cornell Fleischman, St. Louis; (licensed in Missouri in 1905); aged 56; died, June 27, of heart disease.

Gustave Kempf, Detroit; Detroit College of Medicine, 1895; aged 64; died, June 27, of pulmonary tuberculosis.

Correspondence

THE HISTORY OF SYPHILIS

To the Editor:—I have just read the Special Clinical Article in THE JOURNAL of August 21 by a distinguished syphilographer (Cole, Harold N.: Congenital and Prenatal Syphilis, THE JOURNAL, Aug. 21, 1937, p. 580). This contains a section titled Historical Review, from which I quote the following:

> Torella, 1498, Vella, 1508, and Cataneus, 1516, had the idea that a mother's syphilis was transferred to the child in its passage through the birth canal or later from infected milk or infected mammae. Fallopius, body physician of Pope Alexander VI and of Pope Julius II, noted that wetnurses were infected from syphilitic babies and in 1504 gave the first clinical description of the syphilitic fetus.

Now Gabriel Fallopius was born in 1523 and died in 1562. Pope Alexander VI was pope from 1492 until 1503, when he died, and Julius II was pope from 1503 to 1513. How Fallopius could have been physician to these popes long after they had died, and how he could have written about congenital or prenatal syphilis in 1504, or some nineteen years before he was born, is beyond my comprehension but can doubtless be explained by those who believe that the treponematosis named syphilis by Fracastorio in 1530 first invaded Europe and Asia from the island of Haiti in 1493.

Incidentally I returned yesterday from a 6,000 mile journey, during which I had the privilege of visiting a library containing a rich collection of rare and valuable books and manuscripts, some of which I was able to study and copy. Among other material I had photostated a good clinical description of prenatal syphilis dating to 1363. In fact, I already had some passages of this nature belonging to a period a little over 100 years earlier.

R. C. HOLCOMB, M.D., Upper Darby, Pa.
Captain, Medical Corps, U. S. Navy, retired.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

IDE COLOR TEST FOR SYPHILIS

To the Editor:—I have recently received a circular with regard to the Ide Color Test for syphilis. Such a simple and convenient test would be very valuable. What is its present status as to accuracy?

M.D., Burlington, Iowa.

ANSWER.—Sobei Ide and Tamao Ide reported on their test in the *Journal of Laboratory and Clinical Medicine* **21**:1190 (Aug.) 1936. No significant comparative studies with well established tests have as yet appeared in the literature; hence it is impossible to comment at this time as to the dependability of this test.

SALT TABLETS FOR HEAT—POSSIBLE OVERDOSAGE

To the Editor:—What information can you give me on the use of salt tablets in excessive heat? What dangers are there in overdosing in early cases of arteriosclerosis and/or nephritis with potential edema?

M.D., New York.

ANSWER.—The use of salt tablets to combat the ill effects of heat has become an almost standard procedure in hot industries. During very hot weather the majority of all larger manufacturing establishments resort to this practice. A worker engaged in active physical duties on a hot summer day may perspire as much as 6 liters, although the average is lower. The saline content of perspiration is such that as much as 20 Gm. of mineral material may be lost from the body in a single twenty-four hour period. This mineral loss has proved to be the cause or contributing cause of muscle cramps, excessive fatigue and gastro-intestinal upsets. The consumption of water alone or oatmeal water or dextrose water will not allay the physical difficulties resulting from mineral losses. So great is the loss of chloride through profuse sweating that it is almost impossible to replace total loss fully through the consumption of salt tablets or salinized fluids. Workers are encouraged to take one tablet (usually 0.65 or 1 Gm. of sodium chloride) with every drink of water. Seldom do workers consume more than ten tablets a day. The average number is nearer five. If the high number of ten tablets is daily consumed, this represents not more than 10 Gm. of sodium chloride, which does not exceed the average loss of salt through perspiration on a hot summer day. Naturally, considerable salt is taken into the body along with foods, but the combined intake rarely exceeds perspiration losses. In the absence of foolhardy acts of workers who occasionally ingest a handful of salt tablets as an act of bravado, it is not known that any harmful results will arise from the use of salt tablets in industry, in homes and elsewhere. The desideratum of course is to keep the salt replacement at a level or near to the salt losses through excretions and secretions. In early cases of arteriosclerosis or nephritis, with potential edema, no apprehension as to ill effects is warranted so long as the salt intake is maintained on a replacement basis in the body, which is rarely exceeded in the hot industries or during hot summer months through the use of from five to ten salt tablets daily.

BRASS POISONING

To the Editor:—I should appreciate receiving detailed information concerning the subject of brass poisoning—signs, symptoms, diagnosis and treatment.

N. N. FELDMAN, M.D., Holyoke, Mass.

ANSWER.—Ordinarily the term brass is applied to an alloy of copper and zinc. Frequently, however, the term is applied to other metallic materials in which copper is the chief component. Some brass may contain lead to as high a percentage as 50. Nearly all brass contains at least traces of lead as an impurity. Likewise, arsenic may be present as an impurity in quantities sufficient to produce arsenic poisoning. Therefore the term "brass poisoning" is an anomalous one and any chronic disease resulting from exposure in brass manufacture is likely to be either lead or arsenic poisoning. The copper component of brass seldom gives rise to any occupational disease, although copper may not be regarded as entirely innocuous. Molten copper, like many other metals, may give rise to metal fume fever. Green perspiration and greenish discoloration of the hair may be associated with exposure to copper, but such conditions do not constitute genuine diseases. Copper at times leads to a dermatitis, which as an occupational disease is relatively unimportant. On the other hand, the zinc component of brass may lead to a clear cut occupational disease of acute nature. In the making of brass, the melting point of the zinc is so much lower than that of copper that it is necessary to boil the zinc in order to melt the copper. This leads to the evolution of appreciable quantities of zinc oxide in the atmosphere. Workers inhaling this zinc oxide may develop a variety of metal fume fever which in different trades is termed "brass poisoning," "brass workers' ague," "zinc chills" or "foundrymen's chills." The probability of this disease naturally is in proportion to the extent of exposure. Winter weather with enclosed work places favors the occurrence of the disease. This is also true of wet, snowy weather. New workers are prone to acquire the disease until inured. Older workers, absent from the work place, lose their tolerance and may develop difficulties. Commonly the disease does not arise during the work day and during exposure but first appears at night, after exposure on the preceding day. The attack may be characterized by a severe chill and marked thirst. These manifestations commonly give way to a period of profuse sweating, association with some degree of prostration, distaste for food, and indolence. The experienced workman comes to know that he may return to work on the following day, without marked discomfort, perhaps only to suffer from another attack during the following night. Associated with the zinc chills there appears to be a predisposition to respiratory infection, so that some few individuals may lose time from employment on this account. No chronic form of the disease is known and repeated attacks lead to no direct manifestation of impairment other than those associated with lack of sleep, lack of food and frequently the ill effects of undue alcoholism, since the thirst connected with these attacks favors high alcoholic intake. Gastro-intestinal upsets are a frequent concomitant of this form of brass poisoning. There is no known specific treatment, but preventive measures carried out in the plant, such as the wearing of respirators or the procurement of proper ventilation, may ward off attacks. The attack itself calls for no specific treatment. In industries apart from brass founding, such, for example, as galvanizing the zinc oxide produced, combinations with other vapors, such

as sulfuric acid, from pickling vats, leading to the formation of zinc sulfate, may occur. Exposure to such a zinc compound may give rise to dissimilar and more serious manifestations than those described for zinc chills.

OPHTHALMOPLEGIA AND GASTRIC UPSETS IN CHILD WITH POSITIVE WASSERMANN REACTION

To the Editor:—I have a boy, aged 6 years, under my care, who was in good health up to 1934, when he began to have attacks of "pain in the stomach," without vomiting, for two or three days, followed by evidence of oculomotor nerve disturbance (i. e., drooping of the right eyelid and strabismus of the right eye) for three or four days. This cycle was repeated regularly every three months, almost to the day. The father's Wassermann and Kahn reactions were found to be 4 plus. The mother's on two separate occasions were entirely negative. The paternal grandfather died of unknown cause in an insane asylum. The child's Wassermann reaction was 4 plus. Physical examination of the child was negative either for acquired or for inherited evidence of syphilis. The eye symptoms clear up entirely within three or four days. Vision accommodations are entirely normal at intervals. Treatment has consisted of sulfarsphenamine intramuscularly 0.2 Gm. per kilogram (the child is uncooperative in treatment, intravenous therapy being impossible) once a week for six weeks, followed by a bismuth compound intramuscularly for six weeks with a four weeks rest period. One of these courses has been given. The expectant time of disturbance arrived during the course with no stomach symptoms but with an eye disturbance lasting only two days. The Wassermann reaction at the end of the course was negative. Is the outlined course of treatment adequate, or would a continuous type of therapy be advisable? Please advise as to drugs. Would mercury chloride be preferable to bismuth? M.D., Pennsylvania.

ANSWER.—The evidence offered is not sufficient to warrant a diagnosis of gastric crisis. It would seem advisable to have a spinal fluid examination, using a general anesthetic if the child is noncooperative. The eyegrounds also should be examined. The history of recurring ophthalmoplegia in association with the gastric upsets is quite unusual. The use of an arsphenamine preparation for intramuscular administration is advisable in a child of this type. However, the development of blood dyscrasias from the use of sulfarsphenamine has been encountered frequently enough to make its use attended with some risk. Bismuth arsphenamine sulfonate might be used in its place, followed by the bismuth course as suggested or even by mercury inunctions. If the spinal fluid is positive, more intensive measures may have to be adopted, such as intraspinal therapy or malaria therapy. The child should have at least three courses of injections of an arsphenamine with courses of bismuth or mercury compounds interspersed, according to the continuous system of treatment, before the more intensive measures are adopted.

SOFKURD MILK

To the Editor:—What is SofKurd mineral exchange milk? How does it compare with ordinary pasteurized milk in digestibility and nutritive value? M.D., Ohio.

ANSWER.—SofKurd Milk is a trade name for a pasteurized milk from which a portion of the ionizable calcium has been removed. This is effected by passing the milk over "sand" consisting of one of the zeolites. These are hydrated silicates of albuminum and of sodium, potassium or calcium. Compounds of this type containing sodium and potassium exchange these elements for some of the calcium of the milk, which is allowed to flow over them. The procedure is similar in some respects to a method of softening water. If suitable proportions of sodium and potassium are used in the zeolites, the treated milk contains these elements in practically unchanged ratio. Part of the calcium shifts from the milk to the zeolite and along with it goes some of the phosphate by a mechanism that is not well understood. The ratio of calcium to phosphorus in the milk, however, is not changed by this treatment. The chief chemical difference between SofKurd Milk and ordinary pasteurized milk is that the former contains 20 per cent less calcium and phosphates. The originators of the method (Lyman, Browne and Otting: *Indust. & Engin. Chem.* **25**:1297, 1933) showed that the removal of part of the ionizable calcium prevented the formation of a clot by rennin. This milk also forms a soft curd when treated with pepsin and hydrochloric acid. The significance of soft curd qualities has been discussed in a recent report of the Council on Foods (THE JOURNAL, June 19, p. 2122) with the conclusion that milk yielding a soft friable curd in the stomach is well tolerated and more readily (but not necessarily more completely) digested in the stomach than milk producing a hard curd. It should be noted that the determination of the curd tension of "SofKurd mineral exchange milk" by the well known Hill method gives high results unless the coagulating agent is pepsin and hydrochloric acid. This is because the Hill reagent (pepsin plus $CaCl_2$) adds much more calcium than has been removed by the zeolite treatment. The curd tension observed with pepsin and hydrochloric acid as the coagulant is usually around zero and in this respect the milk resembles breast milk. Hess, Poncher and Woodward (*Am. J. Dis. Child.* **48**:1058 [Nov.] 1934) carried out a balance experiment with an infant 80 days old who was fed this type of milk. Throughout the experiment the infant was in positive calcium balance and retained a slightly greater amount of calcium (and therefore a greater proportion of the calcium of the food) when liquid zeolite-treated milk was used than when ordinary milk was fed. In vitro studies indicate that the proportion of ultrafiltrable calcium is greater in "base exchange" milk, which may explain the high proportion of calcium reported to have been retained by the infant on that type of milk. Rogers, Pavey and Williams (*Ohio State M. J.* **30**:441 [July] 1934) used SofKurd Milk as a complemental food for the newborn and recorded that fifty infants fed this type of milk made better gains and suffered fewer losses than fifty babies fed untreated milk. These reports, which are favorable to SofKurd Milk, can hardly be regarded, however, as conclusive proof of the superiority of this product over ordinary boiled milk as a principal food for infants. More extensive clinical investigations would be desirable to establish its nutritive value in the feeding of infants. It seems rational to suppose, however, that any milk which yields a soft curd would be of value in the feeding of older children and of persons who do not easily tolerate ordinary pasteurized milk.

EFFECTS OF SYMPATHECTOMY IN HYPERTENSION

To the Editor:—Will you please furnish me with information concerning the results of celiac ganglionectomy and lumbar sympathectomy with respect to the following points: 1. In an early essential hypertension of two years' duration in a man, aged 35, with a blood pressure of 150 systolic, 110 diastolic, what is the immediate effect? 2. Does the diastolic pressure return to its original level after the initial fall? If so, what is the cause of this secondary rise? Is it from replacement of paralyzed smooth muscle with contracting fibrous tissue? 3. Does the pressure continue to rise past the preoperative level? 4. What are the possible untoward results from these operations, immediate and late? 5. Are any functions other than the vascular affected? 6. In experimental animals with normal blood pressure, does such an operation result in arteriosclerosis of the splanchnic vessels and a secondary rise in pressure above normal? M.D., Ohio.

ANSWER.—1. There is some doubt as to whether extensive sympathectomy combined with first and second lumbar ganglionectomy is indicated. In the first place one should be sure that the man had essential hypertension. This can be determined by hourly readings over a twenty-four hour period and by blood pressure readings taken during immersion of the hands in ice water. If the patient has true hypertension, the systolic pressure will rise from 20 to 50 mm. of mercury. Furthermore, the operation would not be advisable unless the systolic and diastolic pressures drop to normal under the administration of sodium amytal, and unless the pressures drop to normal under the administration of sodium ethyl (1 methyl butyl) thiobarbiturate. In the event extensive sympathectomy (which includes resection of all three splanchnic nerves combined with first and second lumbar ganglionectomy performed bilaterally, with a ten day interval between the operations) is carried out, the immediate effect would result in a return of the pressures to normal or subnormal readings.

2. The immediate pronounced drop is undoubtedly due to the marked vasodilatation that follows extensive sympathetic resection. The subsequent rise to a normal level is probably due to the maintenance of muscular tone by a pressor substance floating within the blood stream. It is doubtful that the contracting fibrous tissue is capable of producing this rise. It is known that the pressures fail to fall following sympathectomy when sclerotic changes are present. Therefore it is fair to assume that the drops in pressure are undoubtedly due to the vasodilatation that takes place when the central nerve impulse has been interrupted.

3. No, if the case has been properly selected. If a patient has an advanced sclerosis, the pressure will continue to rise in spite of sympathectomy.

4. There may be dryness of the skin below the somatic segment section, with excessive sweating above the level. In men there is a loss of ejaculatory power, but this does not disturb the potentia coeundi or libido.

5. Yes; some patients may have diarrhea for a limited period.

6. Apparently no animals have been studied long enough to prove or disprove the point.

Some authorities believe that sympathectomy for hypertension has no sound foundation and has only served the purpose of destroying a large and important system of nerve fibers to obtain varied and nonuniform responses. The question has been raised as to whether the operation, even though it does

alter blood pressure, has actually changed the course of the progressive pathologic process in true essential hypertension. The eyeground studies in one series of patients certainly showed no improvement in the vascular disease or in the morbidity.

THALAMIC SYNDROME

To the Editor:—A man, aged 70, sitting on a bench Oct. 24, 1936, felt weak and collapsed and had to be carried to his home. He did not lose consciousness. He complained of headache and tingling and numbness of the right side of the body. Physical examination revealed a hemianesthesia of the entire right half of the body, with a definite line of demarcation. There was muscular weakness on the affected side but no motor paralysis. The eyes reacted sluggishly to light and in accommodation. The right corneal reflex was gone; the tongue protruded well, without deviation. There was no distortion of the face. The heart rate was 84, regular and of good quality. The blood pressure was 212 systolic, 110 diastolic. The lungs were clear. The abdomen was flabby and somewhat distended; the reflex on the right was hypo-active. The knee jerks were bilaterally diminished, with a suggestive Babinski on the right and no ankle clonus. The right side of the body was insensitive to pin prick, temperature or deep pressure. The Wassermann reaction was negative. The urine at the first examination showed albumin ++ and a few granular casts but on a later check up was clear. The blood nonprotein nitrogen was normal. A diagnosis of hypertension, arteriosclerosis and left-sided cerebral hemorrhage in the area of the thalamus, the posterior portion of the internal capsule, was made. A neurologic consultation was held. Nursing care with absolute rest in bed was prescribed. Glyceryl trinitrate 1/150 grain (0.4 mg.) and sedatives caused marked improvement in his condition. There was a gradual return of sensation, first pin prick, then temperature, and lastly ability to distinguish the form and shape of objects felt. His blood pressure ranged from 180-200 systolic and 98-108 diastolic. He was able to get up from bed within the month and gradually get up and about the house. However, there appeared marked paresthesias—a senation of burning, coldness, sweating and shooting-like pains on the right side of the body, being most marked in the right upper extremity. These have persisted since, and in the past week they have been so pronounced as to cause him again to become bedridden. It has also affected him mentally, for he has become despondent and gloomy, giving way readily to crying spells. Sedatives, such as bromides and amytal, analgesics, aminopyrine, salicylates, nitrites, iodides and lastly narcotics have been of no avail. Local therapy to the extremities, consisting of dry and moist heat, also have given no benefit. I have sought the advice of a neurologist and medical men but have been unable to obtain information that has been of aid. Any suggestion as to possible therapy for relief of the paresthesia, burning and coldness will be greatly appreciated.

MAX B. FERSHTMAN, M.D., Bronx, N. Y.

ANSWER.—The patient no doubt has what is described as thalamic pain as well as a thalamic syndrome. The pain and the emotional state mentioned are typical of involvement of that structure especially when they occur in conjunction with or follow a hemiparesis, hemianesthesia and hemianopia. Often there is considerable pain with loss of pin prick sensibility over the painful regions. This is known as analgesia dolorosa. The pain and paresthesias sometimes become intractable. Fortunately, in most of the cases the pain ultimately disappears with the return of partial thalamic function. Until then one may have to resort to morphine, codeine or strong hypnotics. If, however, the pain does not subside, posterior commissure section or chordotomy can be done in the cervical cord.

FRENUM OF UPPER LIP

To the Editor:—A child, aged 11 months, has a separation of the upper central incisors due to hypertrophy of the frenum of the upper lip, which is attached to the roof of the mouth. At what age should this muscle be cut and at what place? Should the teeth be wired now or should one wait until the permanent teeth appear?

M.D., Arkansas.

ANSWER.—In general the best time for operation on the frenum labii superioris is between 5 and 6 years or between 9 and 10 years. Separation of the central incisors either temporary or permanent is not in itself an indication for operation. The median suture between the intermaxillary bones normally persists in the anterior portion until quite late in life. The central incisors, therefore, both temporary and permanent normally erupt with quite a wide space between. The permanent centrals are normally brought in contact by the pressure of the erupting laterals and canines.

There is a wide range of variation within normal limits in the structure and attachment of the frenum. Usually at birth or some time afterward it is attached at the crest of the alveolar process. As the alveolar process grows downward and forward carrying with it the temporary incisors, the attachment of the frenum should be left behind. It occasionally happens that the frenum extends over the crest of the alveolar process and is attached to the fibrous tissue of the incisal papilla on the palatal slope. In such cases the attachment is not left behind on the labial surface of the process but extends between the incisor teeth as a pad or mat of fibrous tissue, which prevents the central incisors from coming together. This condition cannot usually be positively determined before the fourth or fifth year. When operation is indicated this dense mat of fibrous tissue should be dissected out from between the teeth and removed, the wound being closed by two or more sutures in the gum tissue.

When operation is delayed until the ninth or tenth year the teeth should be moved together by a mechanical appliance first and then the appliance removed; the teeth will separate in a few days. The operation is then to be performed, the tissue dissected out and the appliance replaced and the teeth immediately brought together so that in healing the connective tissue fibers will unite from tooth to tooth as they should. This band, extending from the mesial surface of one central to the other, normally holds these teeth in contact and unless this attachment is formed immediately after the operation the teeth will eventually separate. Operation before the completion of the temporary denture is seldom if ever indicated.

ORDINARY OR ENTERIC COATED GLANDULAR PRODUCTS

To the Editor:—1. Are glandular products such as thyroid, ovarian, pituitary or adrenal, when prescribed in ordinary capsules, destroyed by the acid present in the stomach? 2. What is the opinion at present on enteric coated medication? What chemical is used and what proof is there that the capsules pass unchanged through the stomach?

ROBERT D. KANE, M.D., Elmhurst, N. Y.

ANSWER.—1. Of these endocrine products it is only thyroid that is definitely known to be active when given orally. Its activity is not appreciably destroyed by the digestive juices and it need not be given in enteric coating. The others have no clearly demonstrated value when given orally whether in ordinary or in enteric capsules. 2. Enteric coating is accomplished by phenyl salicylate, keratin, shellac or mixtures of these, or by gelatin hardened with formaldehyde. X-ray examination after the swallowing of opaque (e. g., barium sulfate containing) capsules yields the most obvious proof as to the location of disintegration. When an enterically coated capsule containing sodium iodide and methylene blue is swallowed, marked delay in the appearance of the iodide reaction in the saliva indicates that the capsule probably did not disintegrate in the stomach, while lack of appearance of greenish color in the urine would indicate that the capsule did not disintegrate at all. The sifting of the stools would, of course, also demonstrate lack of disintegration.

LARGE INGUINAL RINGS AND DEVELOPMENT OF HERNIA

To the Editor:—What attitude should a physician examining factory employees take regarding large external inguinal rings? I find men with no hernia but rings that will admit a finger for a full joint (size 7½ hand) and some rings nearly two fingers across. Are these patients more likely to develop hernias than the normal tight ringed persons?

M.D., Michigan.

ANSWER.—Erdman (Nelson Loose Leaf Surgery, vol. 4, p. 610) stated that the enlargement of the external ring, which was found in 2.2 per cent of 2,000,000 drafted men, according to the report of the surgeon general, may be an important determining factor in the occurrence of primary direct hernia.

Gorton (Compensable Hernia, *J. Indiana M. A.* **23**:521 [Nov.] 1930) believed that hernia of weakness which may be due to congenital weakness of the abdominal muscles, or atrophy following disease in the absence of a preformed sac, is rare.

Some believe that the so-called hernia of weakness may be either direct or oblique. The latter type occurs lateral to the inferior epigastric vessels and outside the cord. It is much more common than is generally realized.

It is probable that with an unusually large external inguinal ring, in the absence of a preformed sac, there is a tendency to the development of the so-called hernia of effort. This belief is further strengthened by the observation that there is often an associated weakness of the deeper layers of the abdominal wall together with an imperfect development of the external oblique fascia.

While adequate support from all layers of the inguinal region, even if weakened, might be strong enough to withstand ordinary intra-abdominal pressure, the absence or weakness of the external oblique fascia may be sufficient to permit herniation, particularly under effort.

A number of persons who were refused work by company physicians because of an unusually large external ring have been operated on. In a fairly large percentage there was a definite weakness in Hesselbach's triangle and in some an incompletely obliterated peritoneal process, which could not be determined before operation.

INFECTIONS OF HANDS IN MEAT HANDLERS

To the Editor:—I am called on at times to treat infections of the hands of butchers and others who handle meat. They seem to be the result of infected cuts and scratches. I have been told that mutton is the cause, but I have had instances in which no mutton was handled. In one instance it followed a small scratch on the thumb made by a spicule of beef bone. This acted in some respects like erysipelas, but there was little systemic reaction, just a dusky area of redness, which spread down the thumb and across the palm; the redness was deepest where the saw and cleaver would bruise the hand. Some cuts will fill with pus and resemble a pyocyaneus infection. What is the nature of these infections? Allergic? Streptococcic? Is it the meat itself or a subsequent pollution? One man stated that smoked meat never bothered him but that fresh meat was a frequent cause. THEODORE BAKER, M.D., Blairsville, Pa.

ANSWER.—The infections referred to are doubtless due to inoculation of open wounds with pathogenic organisms of varying virulence. Meat is an excellent culture medium for bacteria of all sorts, just as is milk and every other form of perishable food. The hands of butchers are constantly exposed to bacterial contamination and it is only logical that when they receive cuts the open wounds should frequently become infected. The type of infection and the wound secretion, just as in other cases, depends essentially on the type and virulence of the organism and the patient's resistance. Since meat is usually kept at comparatively low temperatures, the virulence of the organisms on its surface is likely to be diminished. On the other hand, some of the most violent and rapidly spreading infections that one sees in general hospital practice may be due to trivial injuries from a spicule of bone that has caused a penetrating wound of a finger tip.

As a matter of prophylaxis there is nothing more effective than frequent washing of the hands with warm water and soap during the course of the day's work.

MINE GASES AND THEIR EFFECTS

To the Editor:—Will you kindly furnish me with information concerning mine gases and their effects on the human body.

E. F. SHEPPARD, M.D., Jenkins, Ky.

ANSWER.—Solely for the purposes of this brief discussion, mine gases may be divided into two groups: (1) those arising from natural agencies and (2) those produced by dynamite firing and fires. In the former may be found carbon dioxide ("black damp"), although this gas is more often in the second category as a component of "after damp," methane ("fire damp") and hydrogen sulfide ("stink damp"). The popular terms "black damp" and "after damp" do not strictly apply to carbon dioxide, but instead to a mixture of carbon dioxide with nitrogen and other gases commonly produced as a result of explosions. Of the three gases mentioned, carbon dioxide and methane (sometimes ethane as well) act only as asphyxiants. Hydrogen sulfide is highly toxic, causing symptoms in any concentration that may be measured. As little as 0.05 per cent may produce death. In high concentrations this gas leads to quick death from actions on the higher nerve centers. In lower concentrations eye irritation leading to corneal ulcers and inflammation of the eustachian tubes and respiratory tract are characteristic features. This gas as well as methane in certain proportions is highly explosive.

In the latter group may be found the carbon dioxide-nitrogen mixture and hydrogen sulfide and, in addition, carbon monoxide ("white damp") and various oxides of nitrogen. The action of carbon monoxide is too well known to require discussion here. The oxides of nitrogen, of which the peroxide is perhaps the most dangerous, lead insidiously to pulmonary edema, inflammation of the respiratory tract and pneumonia. The slow burning of explosives is far more productive of dangerous gases than their actual explosion. Some or all of the gases mentioned may arise from coal fires, coal dust explosions and gas explosions as well as from the burning or firing of explosives.

COLON BACILLUS PROSTATITIS AND VAGINITIS

To the Editor:—How common is colon bacillus prostatitis and urethritis in the male and vaginitis in the female? Kindly outline a successful course of treatment for both of these conditions.

YEN PUI CHANG, M.D., Lihue, Kauai, Hawaii.

ANSWER.—Colon bacillus prostatitis is a common condition, as about 10 per cent of prostatic cultures will show the colon bacillus. It almost invariably accompanies infection of the urinary tract caused by the colon bacillus. Sulfanilamide has been used with success in the treatment of colon bacillus prostatitis and urethritis. If the patient is an adult of average weight, 5 Gm. may be given daily for one or two days, then 4 Gm. for one or two days, followed by 2.5 Gm. daily for from seven to ten days. This dosage should be immediately reduced, or even discontinued, if toxic symptoms or untoward reactions develop. It must be remembered that acidosis sometimes follows the administration of sulfanilamide. Other undesirable effects, such as jaundice and urticaria, have been reported. Certain studies indicate that blood changes may follow prolonged administration of sulfanilamide. These include methemoglobinemia, sulfhemoglobinemia, granulocytopenia and even hemolytic anemia. It is advisable, therefore, to examine the blood in cases in which there is extensive use of sulfanilamide.

Colon vaginitis is a rare disease even though colon bacilli are commonly found in the vagina. Before such a diagnosis can be made, the presence of cervicitis, Trichomonas infestation and mycotic vaginitis must be ruled out. There is no specific treatment. One per cent gentian violet and a 0.5 per cent solution of acriflavine in glycerin or phenylmercuric nitrate 1:1,500 solution by instillation followed by douches of 1:20,000 can be tried. Wool tampons saturated with merthiolate 1:2,000 are often of value. It must always be remembered that vaginitis is resistant to treatment until cervicitis has been corrected.

ELECTRIC ARC WELDING

To the Editor:—Is there a minimum distance advised for spectators or workmen working around arc welding operations without protective goggles, or does this depend primarily on the susceptibility of different individuals?

W. S. CRAWFORD, M.D., Tulsa, Okla.

ANSWER.—If all electric arcs were the same size and the environment surrounding the arc were constant, it is probable that a fixed minimum distance might be determined beyond which little or no damage would be likely. Light and heat waves are forms of radiant energy appearing in waves of varying lengths. The damaging rays arising in arc welding are ultraviolet, infra-red and visible light rays, which are the source of glare. At the point of formation these rays are concentrated, but obviously they become diluted as the distance from the point of origin increases. Thus the quantity of such rays affecting the eye would be much less at 200 feet than at 20 feet. It is believed that there is a minimum distance of beginning safety for spectators or workmen in arc welding operations, unprotected by goggles or otherwise, but this distance is probably theoretically different for every single arc and depends, among other factors, on the quantity of arc produced, the general level of illumination in the room or other space where arc welding is carried out, and the amount of glare produced.

Studies made by the Medical Department of the U. S. Navy using a thermopile device have been directed to this problem of the distribution of radiant energy around welding operations. The office of the surgeon general of the navy is a likely source of extended information in this matter.

For practical purposes, workmen are little concerned in the dangers of arc welding if the distance from the arc is more than 200 feet, under ordinary circumstances.

EPIDEMIC CATARRHAL JAUNDICE?

To the Editor:—I have been having numerous cases of what I thought was catarrhal jaundice. The cases are similar. Ordinarily the patient appears for treatment jaundiced. There is no pain in the upper right quadrant or other gallbladder symptoms of sufficient severity to account for the jaundiced condition. In a few days that condition clears up and the patient is then in apparently normal condition. I should like to have your opinion as to what is or may be the cause of this condition so that, if possible, I may trace it down and eliminate it.

CHARLES E. VESTLE, M.D., Lansing, Kan.

ANSWER.—The question omits details that would be of value in arriving at a solution. Were there fever, malaise or other signs of acute infection at the onset of the jaundice? Were the stools acholic and did bile pigment appear in the urine? Was there an estimation of the concentration of bile pigment in the blood?

Generally speaking, jaundice is obstructive, toxic or hemolytic. Infectious jaundice is fundamentally obstructive and will be so considered in this discussion. If these were cases of true jaundice it would seem that they must be obstructive, because toxic or hemolytic jaundice would persist over a longer time. Indeed, it is difficult to see how any true jaundice would disappear "in a few days."

The term catarrhal jaundice is used to designate the jaundice resulting from duodenitis with swelling of the distal end of the common bile duct, as well as the jaundice resulting from cholangeitis that involves the bile ducts all the way into the liver.

When the inflammatory reaction is confined to the duodenum and common duct, the jaundice is likely to be of relatively short duration. The symptoms of acute infection are usually

present: fever, malaise and muscle pain. This condition not infrequently is epidemic and effects a community in a fashion similar to an influenza epidemic.

Specific infectious jaundice, resembling Weil's disease, has occurred in American communities. The specific spirochete can usually be found and the course is longer than the course described in these cases. This disease may be transmitted from person to person.

The possibility of the skin being stained by a substance other than bile must be considered unless an elevation of bile pigments in the blood and urine has been demonstrated.

A hypercarotenemia from overindulgence in certain fresh vegetables may produce a yellow stained skin.

Certain chemicals, notably trinitrophenol and certain sulfur derivatives, produce a stain in the skin resembling jaundice.

If, as it seems probable, these cases are "epidemic catarrhal jaundice," the epidemic will be self limited.

DRUGS FOR PARALYSIS AGITANS

To the Editor:—A patient, aged 31, with paralysis agitans, has shown improvement under treatment with 6 grains (0.4 Gm.) of stramonium daily. 1. What is the maximum dose of stramonium and over how long a period may this be given without fear of untoward effects? 2. Do the powdered leaves possess any advantage over the fluidextract? 3. What are the relative merits of stramonium and scopolamine in the treatment of this disease? 4. What drugs besides these two are of value, and what are the dosages?

M.D., Indiana.

ANSWER.—1. The dose of stramonium as well as of the other drugs of the belladonna series used in paralysis agitans is "dose enough" to accomplish the result without excessive discomfort. The dryness of the mouth and skin and the dilatation of the pupil are sufficiently distressful to make it unlikely that a sufficient dose will be taken to do any real harm.

2. It is not known that the powdered leaves possess advantage over the fluidextract, but it is known that sometimes one tincture of stramonium acts better than a tincture of another lot, so that the question may well be raised whether there might be differences in the extraction of the drug or in the drug itself. The use of the powdered drug would eliminate any doubt as to the possible incomplete extraction of active principles or their alteration during the process of extraction.

3. It is a curious fact that patients with paralysis agitans may find one of these drugs of similar action preferable to the other. Thus there are some patients who seem to get most benefit from scopolamine hydrobromide.

4. Atropine may succeed in cases in which scopolamine and stramonium fail. The same principle governs the method of using atropine that is employed in apportioning the dosage of the other agents of this series in this condition. Thus Benhamou, Fourès and Cixous (*Paris méd.* **2**:484 [Dec. 14] 1935) recommend atropine sulfate in a solution of 0.5 Gm. to 100 cc., a drop, therefore, corresponding to 0.25 mg. (1/240 grain) of atropine. The schedule starts with one drop three times a day, at breakfast, in the middle of the day and in the evening. From one to two drops is added each day until the amelioration of the symptoms does not increase. After from seven to eight days the dosage is progressively diminished drop by drop until the motor spasms recur. It is then continued at the minimal dose that produces optimal results. A daily dosage as high as from 100 to 140 drops (from 25 to 35 mg.) of atropine may be reached without the occurrence of toxic symptoms.

TEST FOR ALCOHOL IN BLOOD

To the Editor:—In THE JOURNAL, Dec. 26, 1936, page 2145, appears an alcohol blood test by Widmark used by Berlin police. Is this test reliable? If so, where can I find how to do this test?

M. PAUL TRAVERS, M.D., Miami, Fla.

ANSWER.—The Widmark test for determining the concentration of alcohol in the blood is reliable within a fraction of 1 per cent. It requires, however, a considerable chemical technic and is rather time consuming. All information dealing with this test appears in the German literature. Widmark's original contribution appeared in the *Biochemische Zeitschrift* **131**:473, 1922. There are numerous references to the test in the German literature subsequent to this. Two of the recent ones are as follows:

Koller, Josef: Zur Technik der quantitativen Alkoholbestimmung im Blut nach der Methode Von Widmark, *Deutsche Ztschr. f. die ges. gerichtl. Med.* **19**: 513, 1932.

Kuntz, H. R.: Bemerkungen zur Technik der Blutalkoholbestimmung nach Widmark fur reichen Untersuchungen, *ibid.* **24**: 273, 1935.

A modification of the Widmark test, much simpler, less time consuming, and accurate within clinical limits is described by J. C. Ables in the *Proceedings of the Society for Experimental Biology and Medicine* (**34**:346 [April] 1936) under the title "A Simple Method for the Determination of Ethyl Alcohol in Blood."

RUPTURE OF LIVER

To the Editor:—Would you kindly send me information regarding the mortality, the prognosis and the number of cases of recovery following operation for rupture of the liver due to trauma.

M.D., New York.

ANSWER.—According to Deaver and Ashhurst (Surgery of the Upper Abdomen, ed. 2, Philadelphia, P. Blakiston's Son & Co., 1921, p. 598) the mortality in cases of rupture of the liver not treated operatively is probably about 80 per cent. Tilton (*Ann. Surg.* **41**:27, 1905) considers the mortality in cases in which operation is performed about 60 per cent. Undoubtedly there are many minor ruptures of the liver that recover without operation. In cases in which the hemorrhage is subcapsular, the need for immediate operation is less pressing. Moynihan (Abdominal Operations, ed. 4, Philadelphia, W. B. Saunders Company **2**:236, 1926. Ochsner and DeBakey in Christopher's Textbook of Surgery, Philadelphia, W. B. Saunders Company, 1936, p. 1283) believes that instant operation is advisable in suspected cases. The mortality is definitely increased in delayed operation.

SOLUTION OF POSTERIOR PITUITARY IN TREATMENT OF HERPES OF EYE

To the Editor:—Will you kindly advise me regarding the therapeutic effect of double strength solution of posterior pituitary in treating herpes and dendritic ulcer of the cornea. Has this drug any healing properties or does it merely relieve the pain? In Gifford's "Ocular Therapeutics," page 125, it is intimated that solution of posterior pituitary should be given for the pain only but says nothing as to its healing or curative effects.

C. L. CHAMBERS, M.D., Des Moines, Iowa.

ANSWER.—The use of solution of posterior pituitary is not advised in the treatment of dendritic ulcer of the cornea (herpes simplex) but only for herpes zoster ophthalmicus. In this condition it seems to affect the pain alone and none of the other signs of the disease. If the cornea is involved, other local treatment will be necessary. The only mode of general treatment that affects the course of herpes zoster seems to be the use of convalescent serum or whole blood of convalescents in large quantities. Serum from patients who have recently had varicella seems to be of almost equal value if zoster serum is not available.

RAYNAUD'S DISEASE

To the Editor:—A woman, aged 42, has Raynaud's disease. At present the fingers and toes get white to purplish, painful and numb. From laboratory tests all defects of the body are being cared for and she feels somewhat improved. What suggestions have you?

M.D., California.

ANSWER.—In some instances Raynaud's disease is not perilously harmful, since it does not progress. In most instances there is a tendency to gradual progression characterized by increasing ease with which attacks of discoloration of digits are induced, by recurrent infections about the fingernails, by small, painful ulcerations on the ends of the fingers, or by scleroderma.

Sympathectomy, with which neurosurgeons have had a wide experience, is uniformly successful when performed for Raynaud's disease involving the lower extremities. This uniformity of success is lacking to some degree in operations on the sympathetic nervous system for Raynaud's disease affecting the upper extremities. However, in the hands of an experienced neurosurgeon the probabilities of complete cure or significant amelioration are good.

It is probable that this patient should have a sympathectomy. The subject is reviewed and references are made to other articles by Allen and Brown in their article on Raynaud's Disease in THE JOURNAL, Oct. 29, 1932, page 1472.

VITAMIN B AND HAIR COLOR

To the Editor:—Please give me references to reports on the use of the B vitamins in restoring natural color to gray hair.

ISIDOR F. SHAPIRO, M.D., Bronx, N. Y.

ANSWER.—Claims that any of the vitamins restore gray hair to its normal color should be regarded with suspicion. Search of the recent literature of vitamins gives no ground for such a claim. According to R. A. Peters (The Vitamin B Complex, *Brit. M. J.* **2**:903 [Nov. 7] 1936) the symptoms of vitamin B_1 deficiency may be loss of appetite, edema, palpitation, breathlessness, especially when there is defective removal of blood lactic acid after exercise, neuritic conditions and painful muscles.

Deficiency of vitamin B_2 is believed to be an important factor in the causation of pellagra. The lack of vitamin B_6 causes dermatitis in rats. Other parts of the vitamin B complex may play a part in the causation of pink disease of children, black tongue in dogs, some heart conditions and some forms of cataract.

TUBERCULOUS EPIDIDYMITIS AND COITUS

To the Editor:—A man, 44 years of age, married, has renal tuberculosis with unilateral epididymitis and orchitis of several weeks' duration. His temperature is normal and there is little pain at present. He has been advised to abstain from coitus but states that he is nervous and irritable and that in spite of the advice he has had intercourse once or twice and feels much better for several days afterward. How much harm will this do him? Is there danger of coitus causing a bilateral involvement?

M.D., Colorado.

ANSWER.—It seems unlikely that the patient will do himself harm by having coitus once or twice a week, especially since he feels better for several days afterward. In cases of tuberculosis of one epididymis there is always the possibility of involvement of the opposite side. The second epididymis becomes involved in about 40 per cent, averaging about two years after the onset of the tuberculosis in the first epididymis, so that bilateral involvement may take place either with or without coitus. Therefore it seems justifiable to grant permission for coitus.

ARGYRIA FOLLOWING NEOSILVOL NOSE DROPS

To the Editor:—What is the possibility of development of argyria following prolonged use of neosilvol in the form of nose drops? I can find no reference to this subject in the literature I have consulted.

M.D., North Carolina.

ANSWER.—In their summary of generalized argyria, Gaul and Staud (Clinical Spectroscopy, THE JOURNAL, April 20, 1935, p. 1387) state that "argyria developed in 65 per cent following pharyngeal and intranasal applications and in 35 per cent following peroral administration. The duration of the local and systemic treatment varied from one month to eleven years. Neosilvol was used in 20 per cent, collargol in 22 per cent, and argyrol in 55 per cent of the cases." In a table they give references to fifteen articles citing neosilvol as the cause of generalized argyria.

STERILIZATION AND PRESERVATION OF COCAINE SOLUTION

To the Editor:—Please tell me the proper way to make a sterile solution of cocaine for use as a local anesthetic in the eye, and how long it will remain sterile if not contaminated.

M.D., Ohio.

ANSWER.—Cocaine solutions may be sterilized in the autoclave at 15 pounds for fifteen minutes without interfering seriously with their effect. Such solutions when kept sterile can be used for two to three weeks and probably longer. With solutions for instillation which are opened frequently it is best to add 40 grains of boric acid crystals to the ounce to prevent mold and bacteria. The solution prepared in this way remains clear and retains its effect for several months.

CONTACT LENSES

To the Editor:—A recent magazine article described the use of contact lenses in place of ordinary glasses. This article appeared in *Collier's* for June 26. I have been requested by a patient to get some information on this subject. What is the current opinion as to the safety of such lenses?

LEWIS BOOKER, M.D., New Castle, Del.

ANSWER.—There is a thorough review of the question of contact glasses in the June issue of the *Archives of Ophthalmology* by Mr. T. E. Obrig of New York. Among those who have had experience with contact glasses it is believed that there is less danger of injury to the eye by breakage than from ordinary spectacles.

IS THERE A MALE CLIMACTERIC?

To the Editor:—Is there a male climacteric and is it attended by physical and nervous phenomena? What therapy is available?

M.D., Pennsylvania.

ANSWER.—Although the term "male climacteric" has been used by several writers, the accuracy of the term is doubtful. The female climacteric represents the definite cessation of a function accompanied by certain phenomena which vary in intensity and the entire clinical picture may take a few years and does not start or terminate at the same time in different women. In the male, however, there is no such definite cessation of function. One man may lose his sexual vigor at 30 and another man may continue to be sexually vigorous beyond 70. It is true that as a rule between 55 and 60 the sexual vigor declines and also around this time the prostate may give trouble, but these symptoms do not necessarily appear, whereas the menstrual function in the female must stop at some time, generally between 45 and 50. It seems no more logical to speak of a male climacteric than it would be to call the ages between 5 and 10 the measles period because many children get measles at this time.

FRENUM OF UPPER LIP

To the Editor:—Will the removal of the frenum of the upper lip, at its attachment between the central incisors, prevent too large a space between the central incisors in babies and will it cause a narrowing of this space? Would you consider this an accepted surgical procedure?

E. P. WEIH, M.D., Clinton, Iowa.

ANSWER.—Removal of the frenum of the upper lip, at its attachment, is of benefit in narrowing the space between the central incisors. However, this procedure is not advisable until the permanent upper lateral incisors have erupted. When these teeth erupt, they often force the central incisors together. If, however, after the lateral incisors have erupted, the space between the central incisors is still too wide, removal of the attachment of the frenum to the periosteum is an acceptable procedure.

SYPHILIS IN PREGNANCY

To the Editor:—The answer under "Syphilis in Pregnancy" (THE JOURNAL, August 7, p. 451) contains a serious mistake, which deserves correction. It states that a positive Wassermann reaction on the cord blood specimen is a reliable criterion of syphilitic infection of the new-born infant. Modern literature is filling up with corrections of this old misconception. A positive Wassermann (or other reliable serologic test for syphilis) on the cord blood or on venous blood of the new-born infant may, and very often does, simply reflect the presence of syphilitic "reagins" transmitted from the Wassermann-positive mother to her infant in utero. This transmitted reaction may persist for several weeks or months. One way of evaluating it is to titrate the strength of the reaction, a falling reaction presumably indicating such a passive transfer of "reagins" from the mother. A rising titer would indicate probable syphilitic infection of the infant.

Not all laboratories are equipped to carry out such a titration. In that case, reliance should be placed on physical examinations, roentgenograms of the long bones, and a persistence of the positive serologic reaction. According to a personal communication from Dr. Christie of Harriet Lane Home, Johns Hopkins Hospital, a definitely positive serologic reaction at four months probably indicates syphilis. One should add that even the best and most sensitive tests on the serum are not always positive on a single examination, but certainly they are when the infant has clinical signs of congenital syphilis.

One should emphasize the point that the "washing out" of the early positive transmitted reaction does not necessarily preclude the later development of a true positive reaction and clinical signs of syphilis. Therefore, an apparently uninfected infant, born of a syphilitic mother, should be kept under observation for at least one year.

JOHN V. DAVIES, M.D., Boston.

ERGOTAMINE TARTRATE IN MIGRAINE

To the Editor:—In Queries and Minor Notes (THE JOURNAL, August 7, p. 450) you recommend the hypodermic use of 1 mg. of ergotamine tartrate. "Relief afforded by the hypodermic injection of ergotamine tartrate (1 mg.) at the onset of a seizure would be of further diagnostic value." Having had experience in the use of the drug, I should like to call your attention to the fact that the injection of such a quantity might prove distinctly dangerous. It has been our custom never to inject at a single time more than 0.5 mg. (1 cc.) of ergotamine tartrate (gynergen), the usual initial dose being 0.25 mg. May I take the liberty of referring you to Lennox and von Storch: Experience with Ergotamine Tartrate in 120 Patients with Migraine (THE JOURNAL, July 20, 1935, p. 169, and von Storch: *New England M. J.* **217**: 247 [Aug. 12] 1937).

I am in the process of preparing a study of the dangers and accessory effects concerned in the use of ergotamine tartrate in the treatment of migraine in a series of patients treated for from three to five years. In brief, large doses of ergatomine tartrate may be given over a long period of time if the following precautions are rigidly observed: not more than 0.5 mg. at a single hypodermic injection, nor more than two such injections in twenty-four hours, 0.25 mg. always to be used as the initial dose when introduced intravenously; not more than five 1 mg. tablets to be used by mouth followed by two per hour to a total of eleven. Contraindications are coronary disease, obliterative vascular disease, hypovitaminosis (C), active infection and hepatic disease.

T. J. C. VON STORCH, M.D., Neurological Unit, Boston City Hospital, Boston.

EOSINOPHILIA IN PERIARTERITIS NODOSA

To the Editor:—In THE JOURNAL, August 7, p. 453, in Queries and Minor Notes, is a reply to a question regarding eosinophilia, in which mention is made of various diseases that may cause eosinophilia. No mention is made of periarteritis nodosa. About 12 per cent of the cases reported have shown an eosinophilia, in one case of 77 per cent. I recently had a case with a total leukocyte count of 20,000, with 50 per cent eosinophils. Textbooks on hematology do not include it as a cause of eosinophilia. Biopsy of a tender area in the calf muscles or deltoid should be done.

BENJAMIN P. SANDLER, M.D., Bronx, New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 28. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science.* Tucson, Sept. 21. Sec. Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, Oct. 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Nov. 1. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Dec. 21-22. Sec., Dr. L. J. Kosminsky, Texarkana. *Medical (Eclectic).* Little Rock, Dec. 21. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Sacramento, Oct. 18-21. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento.

COLORADO: Denver, Oct. 5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 9. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical (Regular).* Hartford, Nov. 9-10. *Endorsement.* Hartford, Nov. 23. Sec., Dr. Thomas P. Murdock, 147 West Main St., Meriden. *Medical (Homeopathic).* Derby, Nov. 8-9. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 12-14. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 27-28 (probable dates). *Medical.* Washington, Jan. 10-11. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 15-16. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 12-13. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Oct. 11-14. Sec., Dr. James A. Morgan, 48 Alexander Young Building, Honolulu.

IDAHO: Boise, Oct. 5. Commissioner of Law Enforcement, Hon. J. L. Balderston, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 19-21. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

IOWA: *Basic Science.* Des Moines, Oct. 12. Sec., Dr. W. L. Strunk, Decorah.

KANSAS: Topeka, Dec. 14-15. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 7-9. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MAINE: Portland, Nov. 9-10. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical (Regular).* Baltimore, Dec. 14-17. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, Dec. 14-15. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 8-10. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Lansing, Oct. 13-15. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 5-6. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 19-21. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, Dec. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 20-22. State Health Commissioner, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 5-6. Sec., Dr. S. A. Cooney, 205 Power Block, Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 5-6. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 1-3. Sec., Dr. John E. Worden, Carson City.

NEW JERSEY: Oct. 19-20. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 11-12. Sec., Dr. Le Grand Ward, Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 4-7. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, Dec. 6. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

OHIO: Columbus, Dec. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, Dec. 8. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 20. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, Jan. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Oct. 7-8. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 9. Sec., Dr. A. Earle Boozer, 505 Saluda Avenue, Columbia.

SOUTH DAKOTA: Pierre, Jan. 18-19. Director of Medical Licensure, Dr. B. A. Dyar, Pierre.

TENNESSEE: Memphis, Sept. 29-30. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Wichita Falls, Nov. 8-10. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 8. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 8-10. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WEST VIRGINIA: Charleston, Nov. 8-10. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science.* Madison, Sept. 25. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 11-14. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

WYOMING: Cheyenne, Oct. 4. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners and Special Boards* were published in THE JOURNAL, September 11, page 896.

Utah June Report

Mr. S. W. Golding, director, Department of Registration, reports the written examination held by the State Board of Medical Examiners in Salt Lake City, June 21-23, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. Thirteen physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1935)	88.5
George Washington University School of Medicine		(1935)	86
Northwestern University Medical School		(1937)	83.5,* 85, 88.2, 88.5
Rush Medical College		(1936)	83.7
Louisiana State University Medical Center		(1937)	86.2*
University of Oregon Medical School		(1937)	89.3†
Temple Universty School of Medicine		(1936)	82

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1936)	Colorado
Northwestern University Medical School		(1935)	Illinois
School of Med. of the Division of the Biological Sc.		(1935)	Arizona
Indiana University School of Medicine		(1935)	Indiana
University of Louisville School of Medicine		(1926), (1936)	Kentucky
Tulane University of Louisiana School of Medicine		(1935) (1936)	Florida, Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons		(1936)	Maryland
University of Michigan Medical School		(1934)	Michigan
Washington University School of Medicine		(1935)	Missouri
Cornell University Medical College		(1933)	New York
Memphis Hospital Medical College		(1909)	Tennessee

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship. License has not been issued.

† License withheld pending completion of internship.

Illinois April Examinations

Mr. Homer J. Byrd, superintendent of registration, Illinois Department of Registration and Education, reports the written and practical examination held at Chicago, April 6-8, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Fifty-one candidates were examined, 50 of whom passed and one failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Chicago Medical School	(1937) 80, 83,* 86, 87,		92
Loyola University School of Medicine		(1937)	87*
Northwestern University Medical School	(1935) 86, (1936) 84, 85*, 86, 89, (1937) 84, 84, 84, 84, 85, 86, 87, 88	(1934)	87,*
Rush Medical College	(1937) 83, 84, 84, 84, 85, 85, 86, 86, 86, 86, 86, 87, 87, 89	(1936)	86,
School of Medicine of the Division of the Biological Sciences		(1935) 89, (1936) 83,* (1937)	84
University of Illinois College of Medicine		(1936)	89
University of Buffalo School of Medicine		(1933)	84
Hahnemann Medical Col. and Hosp. of Philadelphia		(1935)	81
Meharry Medical College		(1935) 80,	84
University of Toronto Faculty of Medicine		(1935)	87
Medizinische Fakultät der Universität Wien		(1933)	86†
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1925) 84,† (1936)	82†
Hamburgische Universität Medizinische Fakultät		(1920)	85†
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn		(1929)	86†
Universität Basel Medizinische Fakultät		(1934)	87†

School	FAILED	Year Grad.
Chicago Medical School		(1937)

Eighteen physicians were successful in the practical examination for reciprocity and endorsement applicants given in Chicago, April 8. The following schools were represented:

School	PASSED	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1934)	Arkansas
Northwestern University Medical School		(1934)	California
Rush Medical College		(1936)	Alabama

University of Illinois College of Medicine	(1935)	California
State University of Iowa College of Medicine	(1930)	Iowa
University of Kansas School of Medicine	(1932) (1934)*	Missouri, Kansas
Wayne University College of Medicine	(1934)	Michigan
St. Louis Univ. School of Med.	(1930),* (1932),* (1935)	Missouri
University of Cincinnati College of Medicine	(1918)*	Ohio
Temple University School of Medicine	(1927)	Minnesota
Baylor University College of Medicine	(1934)*	Texas
Medical College of Virginia	(1932)	Virginia

School	PASSED Year Grad.	Endorsement of
Loyola University School of Medicine	(1936)	N. B. M. Ex.
Northwestern University Medical School	(1934),* (1935)	N.B.M. Ex.

* License has not been issued.
† Verification of graduation in process.

Book Notices

A Brief Outline of Modern Treatment of Fractures. By H. Waldo Spiers, A.B., M.D., Professor of Orthopaedic and Fracture Surgery, College of Medical Evangelists, Los Angeles, California. Second edition. Cloth. Price, $2. Pp. 137, with 114 illustrations. Baltimore: William Wood & Company, 1937.

The author states in his preface that the book "aims to illustrate the fundamentals in bone surgery and to touch only the high spots in their practical application. Modern textbooks are so filled with illustrations and demonstrations of operative technic, with the discussion of so wide a variety of methods, that the average student or intern is frequently at a loss to know what it is all about." In the main he has adhered to this theme, and the little book has much solid meat in it and should be of use to senior students and those preparing for state board examinations and the like. With such a clear statement as to the purpose, it is strange to find inserted various detailed accounts of operations such as the Watson-Jones approach to the hip joint but with it no reference to where the original article may be found. Bibliographies would be valuable in this book to enable the reader to refer readily to the article cited. The first chapter is devoted to a consideration of fracture problems in general. The statements of the author are necessarily dogmatic and in many spots are plainly taken from lectures to students. The very terseness of the author's statements lose certain of their effectiveness because the reasons back of the assertions are not given; e. g., no mention is made of peroneal paralysis and ulnar paralysis, although warning is issued against pressure over the head of the fibula and the internal condyle of the humerus. No mention is made of the much talked of prone position in transporting persons who have sustained fracture of the spine. Exception can be taken to such a loose statement as "fibrous ankylosis is present in all joints which have been immobilized for any great length of time," particularly when the rest of the paragraph clearly shows that the author is well aware of the true pathology of the type of stiff joints that he is discussing. Another statement, "The popularity of open reduction of fractures is probably based on the fact that to an extent at least the fee will be proportionately larger," is entirely uncalled for and except in rare instances is untrue and has no place in such a book. It takes no great flight of the imagination to see how this may be seized on by unfriendly lawyers and other persons to use against the medical profession. Likewise the statement "In this day of scientific treatment of fractures it is almost criminal neglect to fail to check up the results of reduction by x-ray films" is a two edged sword and surely the very evident necessity of such a procedure could have been couched in more fitting language. The remaining chapters are devoted to special types of fractures and, considering the pages at the author's disposal, are well done. His brevity in discussing such an important condition as ankle fractures might be criticized. The statement that the rather rare but potentially vicious trimalleolar fracture accompanied by posterior displacement of the foot usually required operation to replace the posterior tibial marginal fragment can be questioned, for it is generally agreed that such an operative procedure is but seldom required. The author is evidently a stanch supporter of Böhler's methods. The last chapter, devoted to fractures of the mandible, is evidently inserted in this edition to make for completeness and wisely opens with the advice that patients so afflicted are best handled by the oral surgeon. All in all, here is a useful little book; and the fact that there has been a demand for a second edition may mean that further opportunity for improvement will be afforded the author.

Methodik der Hormonforschung. Band I: Schilddrüse, Nebenschilddrüse, Nebennierenrinde, Nebennierenmark, Pankreas. Von Dr. phil. Christian Bomskov. Paper. Price, 54 marks. Pp. 716, with 251 illustrations. Leipzig: Georg Thieme, 1937.

The author of this treatise has endeavored to include in one book all the essential methods of investigation on the glands of internal secretion. There are detailed reference in this first volume to the thyroid, parathyroid, adrenal cortex, adrenal medulla and pancreas. The result is encyclopedic. A vast amount of information not elsewhere accessible in convenient form is gathered here. This includes details of anatomy, surgical technic (including forms and dosages of anesthetics for various laboratory animals), methods of handling and administering extracts to animals, blood histology and blood chemistry of different species, histologic technic, methods of recording physiologic changes, methods of extraction and purification of glandular extracts, methods of controlling hydrogen ion concentration including tables of indicators, detailed consideration of the physiology of each of the five glands mentioned with reviews of the literature, tables of patents on glandular products and a thousand other items too numerous to mention. It is therefore a useful reference book. But it has a serious fault common to many compilations of this type. The good and the bad are included indiscriminately and quite uncritically. No adequate effort has been made to weed out unsatisfactory methods or to sift carefully the literature on glandular physiology. The errors of fact and judgment in this volume are plentiful, the section on the adrenal cortex being an especially unfortunate example. Many typographic errors occur also. Bomskov's work may therefore be recommended only to experienced investigators in endocrinology, who will find a wealth of useful material but will not be misled by the abundant nonsense that has inadvertently crept in. The book is profusely illustrated with excellent reproductions of photographs and drawings.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1936, with the Comments that have appeared in The Journal. Cloth. Price, $1. Pp. 104. Chicago: American Medical Association, 1936.

This small annual volume is indispensable to the library of physicians, pharmacologists and others who need to keep abreast of the latest developments on the frontiers of medical progress. It gives the details of the Council's consideration of products which have been found unacceptable as preparations for use in rational therapeutics and its reports on those which show promise but are not yet ready for general acceptance.

Among the reports on out-and-out unacceptable products are Amend's Solution and the "Igol" products, iodine preparations marketed under misleading or unacceptable claims, the latter under an uninformative proprietary name; Androstine-Ciba, claimed to be a testicular extract and found to be an irrational combination of inactive preparations, marketed with unwarranted and misleading claims; Gadoment, a preparation of cod liver oil in a wax base with zinc oxide, benzoin and phenol, proposed for use in the treatment of burns, cuts and minor skin irritations, found unacceptable as being an unoriginal product of insufficiently declared composition marketed under a coined proprietary name with unwarranted therapeutic claims, and indirectly advertised to the public; the "Carasyl" preparations, which are essentially mixtures of psyllium flour, karaya gum and fig flour, marketed with unsubstantiated therapeutic claims under a proprietary name.

In 1934 the Council sponsored an exhaustive report on bacteriophage therapy which pointed out that, in view of the present status of knowledge, no such preparations could be accepted for New and Nonofficial Remedies. In this volume of the collected Council reports the Council declares the "Phagoid" preparations, a line of bacteriophage products, definitely unacceptable because they are offered to the medical profession with unscientific, unwarranted claims, thus encouraging physicians to use in a routine way medicaments the therapeutic value of which has not been established, and because the preparations conflicted in other ways with the rules of the Council.

This volume includes a preliminary report on Trichophytin and Oidiomycin—trichophyton preparations marketed by Lederle Laboratories, Inc. This report is a sequel to the preliminary report on Trichophyton Extract issued in 1932, which postponed consideration to await development of further clinical evidence on trichophyton therapy. Also included in this volume is a report on the unacceptability of two trichophyton preparations, Dermatomycol and Dermotricofitin, distributed in this country by Ernst Bischoff Co., Inc., under the stated proprietary names without sufficiently declared composition and with unwarranted therapeutic claims.

Other preliminary reports are Refined and Concentrated Antipneumococcic Serum Type VII-Lederle, Present Status of Tetrachlorethylene (since accepted for N. N. R.), Smallpox Vaccine (From Chick Chorio-Allantoic Membrane)-Lilly, and Use of Trichloroethylene for General Anesthesia.

A short report in this volume relegates to the therapeutic scrap heap the following, which formerly stood accepted: Filicic Acid and Related Substances; Ipecac Principles and Preparations; Manganese Compounds; Betanaphthyl Salicylate; Thorium Salts and Preparations, and Silver Citrate.

Important general reports are those on Injection Treatment of Hernia and Nomenclature of Endocrine Principles. Under the latter are included reports on the nomenclature of corpus luteum hormone, the estrus-producing compounds and the "male hormones." This valuable report enhances the prestige of the Council as a leader in the field of scientific nomenclature.

Studies in Sibling Rivalry. By David M. Levy, M.D. Research Monographs No. 2, American Orthopsychiatric Association, Lawson G. Lowrey, M.D., Editor. Paper. Pp. 96, with 12 illustrations. Menasha, Wisconsin: George Banta Publishing Company, 1937.

This work consists of two studies, originally published in the *American Journal of Orthopsychiatry*. They are presented primarily as an experiment in methodology in which the play activities of children, under controlled conditions, are used to study "principles of motivation in social relationships." The first paper, on the use of play technic as experimental procedure, presents statistical summaries of studies in sibling rivalry. A standardized play situation is used. The child is exposed to a play with dolls in which a brother or sister doll observes a new baby nursing at the mother's breast. The author summarizes the activities observed in response to this hostility-provoking situation and presents the details of the dynamic patterns noted. More particularly he notes distinctive primitive patterns of hostility and definite modifications of these of the nature of atoning for, undoing or denying the effects of the hostile acts.

The second paper is a more detailed study of the patterns of hostility observed in the sibling-rivalry experiments. The subjects were twelve 3 and 4 year old children. Here the author summarizes and graphically charts the precise reactions of the children to the controlled play situation. In addition to the uninfluenced responses of the children, he also observes the effect of offering a direct stimulus toward manifestations of hostility. The activities of the children in attempting to prevent the carrying out of hostile actions, the exact forms and methods whereby hostile acts are carried out, the efforts to make restitution, and the methods whereby the child defends himself against the possible consequences of his hostile behavior are minutely recorded.

It is demonstrated that the dynamics of behavior is essentially the same through the entire series of cases. While details of the pattern vary somewhat, they remain consistent for a given child in repeated experiments. These differences are not accidental but are determined by the child's previous responses in actual sibling-rivalry situations and by other features of his psychic life. The child, at the age of 3 years, already manifests reactions to his hostile tendencies of the nature of checking or controlling them. If the hostile feeling is released, it follows the pattern typical for the child following which "self-redeeming" behavior is manifested.

The author discusses the possible therapeutic effect of exposing children to the opportunity for manifestation of hostility afforded by the experiments. He is able to show that certainly immediate effects of the experiment can be observed, usually of the nature of freer expression of hostility on the part of the child. A favorable change in relationship with the real mother and baby is observed when there has been free release of hostility in the repeated experiments. It is not demonstrated, however, that lasting effects are achieved as a result of the experiments. Some of the children were under active psychotherapeutic treatment other than that connected directly with the experiments.

These studies are of first importance chiefly on account of the demonstration of an objective use of play in the study of the mental life of the child. Stimulated by psychoanalytic experience, the interpretation and meaning of the behavior are derived by direct observation of the repeated sequences. Dr. Levy definitely points a way that should yield fruitful results in the hands of investigators who can be as discriminating as he is in these studies.

What It Means to Grow Up: A Guide in Understanding the Development of Character. By Fritz Künkel, M.D. Translated by Barbara Keppel-Compton and Hulda Niebuhr. Cloth. Price, $2. Pp. 180. New York & London: Charles Scribner's Sons, 1936.

Künkel outlines simply and directly the dynamics of the development of personality types and enumerates the basic determinants in the formation of various behavior patterns. The book identifies critical situations in growth and stresses the necessity of the individual facing them to alter his personality structure in the direction of maturity. Maturity, Künkel states, is gaged by the development of "tension capacity," the possession of which differentiates adult behavior from immature reaction patterns. Tension capacity, which in everyday life is synonymous with courage, enables one to ignore egocentric drives and achieve objective attitudes. A person who lacks this faculty adheres to selfish patterns and is unable to meet menacing life situations satisfactorily. In the last chapter a discussion of the critical growth period from childhood to maturity is well treated. The suggested philosophy of life is constructive and is founded on tangible principles. In emphasizing the part played by early experiences in shaping reaction patterns, the book recalls the extreme attitude of the behavioristic school of Watson. A nontechnical terminology is employed throughout. If only as a popular reformulation of generally accepted principles, the book should prove interesting to parents, teachers and those concerned with child guidance.

Le traitement du diabète infantile par l'insuline. Par M. E. Aubertin, professeur à la Faculté de médecine de Bordeaux. Association française de pédiatrie. Neuvième Congrès des pédiatres de langue française, tenu à Bordeaux, les 28, 29 et 30 Mai 1936. Paper. Pp. 67. Bordeaux: Imprimerie M. Durand, 1936.

This is an excellent summary not only of the use of unmodified insulin in juvenile diabetes but of the dietary treatment and course of the disease. It is divided into four parts, consisting of a discussion of dietary treatment, indications and use of insulin, the accidents of insulin, the indication for insulin therapy in the course of special conditions and end results in treatment. The author believes that practically all cases of juvenile diabetes should be treated with insulin and with a quantitative diet, which prevent the progression of the disease and its complications. He discusses all the dietary forms of treatment, including an unusually good discussion of Stolte's diet. He refers to Allen's experiments of producing degeneration islets by overfeeding and the experiments of La Coste and Saric, who, by undernutrition and insulinization of normal persons, produced a depression of endogenous insulin output. He concludes that a middle course in the treatment of diabetes is indicated, namely, that the carbohydrate should form from 35 to 40 per cent of the total calories, the protein 15, 12 and 10 per cent, according to age, and the fat from 45 to 50 per cent. The caloric value of the diet begins at the age of 1 year with 1,000 calories, and to this he adds 100 calories each year. He points out that the four unusual accidents of insulin administration are infections, lypodystrophy, anaphylaxis and edema. He discusses hyperinsulinism in detail and the fatal cases reported in the literature. In the third part the infrequent occurrence and the treatment of infantile diabetes is discussed, and the treatment during infections and surgery. Tuberculosis, he finds, is a rare complication and hypercholesterolemia an index of poorly controlled diabetes. Cataracts, arteriosclerosis and hepatomegaly are the sequels of failure to control the disease. He concludes with a discussion of preventable causes of death. The work may be highly recommended to all students of the subject.

Toe Casting and Liquid Rubber Technic. By William H. Woolf, Pod.G., Instructor in Podiatry, The First Institute of Podiatry, New York. Edited by Maurice J. Lewi, M.D., President, The First Institute of Podiatry. Cloth. Price, $1.50. Pp. 88, with 73 illustrations. New York: Harriman Printing Company, Inc., 1937.

This little book was written by a chiropodist and edited by a physician. The subject is laboratory technic. It presents the methods by which one can make models of toes, arches, bunions, corns and other minor distortions of the foot. It reveals the way liquid rubber can be utilized in the preparation of corn splints, bunion shields, hammer toe protectors and arch supports. Traction bunion splints can also be made. These liquid rubber appliances are easy to keep clean and can be used a long time. The use of liquid rubber in chiropody will gradually supplant the present leather and felt appliances for foot comfort. It requires some practice to make good models by casting and also practice to use the liquid rubber successfully. It takes too much time for any one but a laboratory technician or appliance maker. The making of these rubber appliances will appeal chiefly to chiropodists and it is for them that this volume was written. The use of liquid rubber has merit and time will improve the technic of preparation and its usefulness.

Diagnostico dos aneurysmas da aorta thoracica. Por Geraldo de Andrade, docentelivre de clinica medica da Faculdade de medicina do Recife, y Aguinaldo Lins, director do Instituto de Radiologia do Hospital Português, Recife. Bibliotheca medica brasileira. Monographias. Série II, Vol. IV. Fabrikoid. Pp. 329, with 93 illustrations. São Paulo: Companhia Editora Nacional, 1936.

This book reports the results of a large clinical and anatomopathologic study of aneurysms of the thoracic aorta, including the ascending, transverse and descending portions. The first and second chapters deal with etiology, pathogenesis and differential diagnosis. Special reference is made to the incidence of aneurysm in relation to age, sex, geographic region and type of work, and on the rôle of either physical or psychic trauma and constitutional (especially cardiac) malformations. This is followed by chapters on the value of certain objective signs in diagnosis, such as the presence of anisocoria, the Argyll Robertson pupil, exophthalmos, Horner syndrome, pallor, congestion of the face, the technic and significance of palpation, and the effects of aneurysms of the thoracic aorta on the radial pulse, the heart rhythm and the arterial and venous pressures. The detailed aspects of the book are illustrated by the presence of chapters on auscultation and x-ray examination of the lungs, the rôle of pain in diagnosis, and the symptoms of aneurysm, which take up four chapters. The x-rays, especially with regard to differential diagnosis, are discussed exhaustively. The bibliography covers eight pages. The book is well prepared, and the printing and the illustrations are neat and clean. The book should be of use to cardiologists, internists and syphilologists.

Wundheilung. Von Prof. Dr. Wilhelm Löhr, Direktor der chirurgischen Klinik des Städtischen Krankenhauses Magdeburg-Altstadt. Paper. Price, 21 marks. Pp. 234, with 141 illustrations. Leipzig: Johann Ambrosius Barth, 1937.

The aim of this book is to emphasize the importance of the nutrition therapy of wounds, and especially of local vitamin therapy by means of cod liver oil, which was introduced by the author over six years ago as a result of his twenty year study of the systemic reaction of the body to wound metabolism. In tabular form the author shows that many therapeutic diets are greatly deficient in the minimal vitamin requirement, particularly of B and of C. This is especially true for the peptic ulcer diet, various dyspepsia diets, the Karell diet and the ketogenic diet. As healing and defense against infection demand an increased supply of vitamins, it is probable, the author believes, that the vitamin deficiency of these diets must be corrected to secure optimal therapeutic results. To remedy this defect he adds yeast to milk in his clinic and employs a diet rich in vitamin C in all acute febrile as well as chronic infections (typhoid, tuberculosis, pneumonia, gastro-enteritis, wounds). Whenever there is doubt as to the proper absorption of vitamin C on account of unfavorable conditions in the digestive tract, he gives it parenterally. The oil soluble vitamins, A and D, he employs whenever possible by local application, although even internal administration of cod liver oil hastens the healing of wounds. He employs with asserted good success, in addition to the Leube diet, 20 Gm. of unrefined cod liver oil four times daily, the last dose at bedtime. The oil is administered either in lemon juice or in apple sauce. Lohr points out that commercial cod liver oil is sterile and that experiments have shown that the best results are obtained by mixing it with petrolatum of a melting point near the body temperature. The addition of cholesterol has proved irritative. He injects from 3 to 4 cc. of pure cod liver oil into chronically inflamed joints with alleged good results. Another item in wound therapy on which the author lays great stress is the closed plaster-of-paris cast, which he applies to all wounds after filling the unsutured wound with cod liver oil ointments. Photographs showing remarkable results with this method are reproduced. He treats in the same manner the large defects left after surgical extirpations and operations; e. g., osteomyelitis and even gas gangrene. He also recommends cod liver oil ointments in burns, no matter how extensive, including those due to x-rays. He ascribes his good results largely to the absolute immobilization secured by his method and avoidance of chemicals, drains and gauze. The author feels emboldened by his results and those of others to suggest that his cod liver oil-plaster-of-paris dressing may make mutilating débridement a thing of the past. To all surgeons the perusal of this book is recommended as a lesson of the *vis medicatrix naturae*. Unfortunately, the author does not see fit to give the exact formula of the salve that he employs, even though he lays great stress on its correct preparation, referring the reader to a special salve made by a manufacturer who is "expert" in this field.

Materia Medica Including Pharmacology and Therapeutic Hints. By S. Chatterjee, B.Sc., M.B., Pharmacology Department, Calcutta Medical Institute. Cloth. Price, 6s. 6d.; Rs. 4/. Pp. 391. Calcutta: Medical Publishers, 1935.

This book is designed primarily for the use of students at the Calcutta Medical School. It is a brief treatise of materia medica and pharmacology in outline form. It contains much essential information, which is readily available because of the size of the book. It is obvious, of course, that a book of this nature cannot serve as a textbook but should prove useful when reference to the more salient features of drug actions, toxicology and therapeutics suffices. A classification of drugs similar to the therapeutic index in Useful Drugs, extended to cover the details of the uses, is included in the book along with the usual tables on foods, incompatibilities and abbreviations. Under "Drugs Acting on the Generative Organs" there is a subheading "Direct Aphrodisiacs": strychnine, camphor, alcohol, opium, cannabis indica and cantharides, and under "Indirect Aphrodisiacs . . . drugs that cause general improvement of health . . .," iron, arsenic, strychnine and glandular products. The index is followed by advertising pages, which include the promotion of some rather unusual preparations. The first is "Hewlett's Mixture"—Mist. Pepsinae Co. c. Bismutho (similar to the British Pharmaceutical Codex preparation Mistura Bismuthi Composita cum Pepsino), which is indicated to be "useful in all forms of dyspepsia, pyrosis, gastric pain, vomiting and for alleviating pain in cases of ulcer and cancer of the stomach." Other advertisements include "Gametoxan," said to be "diethanol dihydroquinamine uranyl hydrochlor," "Neotropin"—no formula given, and "Sulfarsenol"—the latter without any indication that it is a brand of sulfarsphenamine. The book is intended primarily to promote the rational use of drugs common to the practice of medicine in Calcutta and it is therefore rather surprising to find so many advertisements for "patent medicines."

For Peace and Good: A Handbook of Contemporary Politics. By Joseph Tiberius Trencheny, P.Sc.D. Cloth. Price, $2.50. Pp. 174. New York: Economists, Incorporated, 1937.

Although the blurb on the jacket says that the author "is recognized as one of the best informed consulting economists," there is little in the book to indicate that he has a knowledge of even the most elementary principles of any recognized school of economics. The work is essentially one of the utopian schemes which seem to have come forth constantly since the time of Plato. He rewrites the constitution of the United States and proposes a complete reorganization of the American system of government. In spite of the announcement that a

middle course between communism and fascism is to be taken, the author rejects most of the essentials of democracy and follows the pattern of the totalitarian states. He would regulate hours and wages, limit free education to the common school, bar married women from industry, introduce a system of health insurance, and impose a bachelor's tax. The final touch is furnished by the reproduction of a form letter such as every one writing to the President receives, as if it were a presidential recommendation.

Über einige neue Arzneimittel II. Von P. Wolff. Sonderabdruck aus dem Schweizerischen medizinischen Jahrbuch 1937. Paper. Pp. 87-114. Basel: Benno Schwabe & Co., [n. d.].

The steady increase of diabetes mellitus among civilized nations and the extensive search for a prolonged acting insulin brought forth protamine zinc insulin for the treatment of the diabetic patient. In this book the existing literature on insulin and its longer acting substitutes is thoroughly reviewed. Any one acquainted with the subject knows how difficult this task is. This monograph, which appeared in the Swiss medical year book, can be highly recommended to research workers and clinicians who wish to be informed on the various aspects of insulin therapy. Its special usefulness lies in the extensive bibliography.

Manual of Public Health: Laboratory Practice. By J. R. Currie, Henry Meehan Professor of Public Health, University of Glasgow, and Contributors. Cloth. Price, $6.75. Pp. 378, with 169 illustrations. Baltimore: William Wood & Co. 1936.

The author distinctly wants it understood that this manual is written primarily for medical graduates. The subjects include chemistry, bacteriology, protozoology, helminthology and meteorology. It is written with directness, so that there is little waste space. Because of the difference in English pure food laws, many of the food analyses might not apply to American equivalents. The author does not expect physicians to be trained chemists and hence this material is condensed and all discussions are brief, much that is considered to be outside the realm of the ordinary public health officer being dispensed with. There are, however, much information and many illustrations which a doctor called on to assume part time public health duties would find of assistance. While not meeting any urgent need in this country because of legal and geographic variations, this is an eminently practical book.

Bernhard Bang: Selected Works. Edited by Vald. Adsersen, Professor at the Royal Veterinary and Agricultural College, Copenhagen. Paper. Pp. 560, with illustrations. London: Oxford University Press; Copenhagen: Levin & Munksgaard, 1936.

The Danish veterinary pathologist Bernhard Bang died June 2, 1932, in the eighty-fourth year of his life. Shortly before his death Professor Bang was asked to publish in the chief languages a selection of his most important scientific works, which had secured for him a world-wide reputation. The negotiation had not been completed when Professor Bang died. The present volume was edited by Professor Adsersen under the sponsorship of the Rask-Ørsted Foundation. The works included in the present selection of Professor Bang's extensive literary productions have been divided into three groups, in each of which they are arranged in chronological sequence. The first group comprises Bang's investigations on a series of important animal diseases (infectious abortion of cattle, actinomycosis, mastitis in cattle, infections caused by the bacillus of necrosis, endocarditis in swine, erysipelas, chronic bacterial enteritis in cattle, and abortion due to tuberculosis). The second group comprises Bang's investigations on tuberculosis of the udder and on tuberculous milk. The last group comprises a selection of Bang's works on tuberculin and its employment in combating tuberculosis in cattle. Bang's comprehensive literary productions are characterized by an extraordinary degree of simplicity, clarity and conciseness. All students of diseases of animals transmitted to man will profit greatly by a perusal of this volume, particularly as relates to Bang's investigations of those diseases which brought him well merited acclaim: infectious abortion of cattle (Bang's disease), tuberculosis and actinomycosis. Many of the papers are published in the English language; others are written in French or German. The fundamental contribution of Bang in his discovery of the causation of contagious abortion of cattle provided other investigators with the knowledge that led to the later discovery by Evans of the etiologic unity of this disease in cattle and brucellosis (undulant fever) in human beings.

Surgical Anatomy. By Grant Massie, M.B., M.S., F.R.C.S., Assistant Surgeon, Guy's Hospital, London. Third edition. Cloth. Price, $6.50. Pp. 468, with 153 illustrations. Philadelphia: Lea & Febiger, 1937.

Compendiums of anatomy must be brief, concise, accurate, and above all lucid. This small volume possesses all these qualities in a form sufficient to satisfy most persons. Written mainly for the intern and last year medical student, it will fill their needs as well as any other short anatomic reference book. The author strikes a satisfactory balance between anatomy and clinical application and at the same time does not stifle his immature reader with voluminous detail. Illustrations are ample in most cases to describe the text; they are well labeled and fully summarized. While in no sense a substitute for an anatomy book, this volume will serve admirably to refresh the memory on the relation of bodily structure to surgical problems.

Childbirth: Yesterday and Today. The Story of Childbirth Through the Ages, to the Present. By A. J. Rongy, M.D., F.A.C.S., Attending Obstetrician and Gynecologist, Lebanon Hospital, New York City. Cloth. Price, $2. Pp. 192, with 20 illustrations. New York: Emerson Books, Inc., 1937.

This book describes the way in which women of the primitive ages, and those in various civilized countries, coped with the problems of pregnancy and childbirth. In the discussion on childbirth among primitive people is included tribal customs and traditions, and an insight is given into the way in which childbirth was regarded by the Hebrews, Egyptians, Greeks and Romans. Successive chapters discuss the glory and weaknesses of the midwife, history of child care, and history of childbirth. The chapter on the reign of superstitution reveals the source of many of the mysterious customs that arose from ignorance and tradition. Finally birth control and the present day problem of maternal mortality are presented. Those interested in obstetrics and maternal mortality will find much of interest in the book.

Lehrbuch und Atlas der Haut- und Geschlechtskrankheiten. Von Dr. Karl Zieler, ö. o. Professor und Vorstrand der Universitäts-Klinik und Poliklinik für Haut- und Geschlechtskrankheiten in Würzburg. Textband; Tafelband. In two volumes. Fourth edition. Cloth. Price, 56 marks. Pp. 684, with 171 illustrations; 196, with 378 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1937.

One of the most valuable features of this textbook is the series of drawings in black and white by Freytag. These illustrations are admirably done. The colored plates also, which are from Jacobi's historic atlas, are masterpieces of their kind. The text, for so large a volume, is rather sketchy and incomplete. The section on syphilis, pages 382 to 566, probably is best. The suggestions regarding treatment are practical. Apparently the author has great confidence in mercury as a spirocheticide. Malarial therapy in syphilis is discussed, but heat treatment does not receive the attention that its value merits. About 10 per cent (seventy pages) of the first volume is devoted to the history, symptomatology and treatment of gonorrhea. The index is comprehensive.

Diabetes: A Modern Manual. By Anthony M. Sindoni, Jr., M.D., Chief of the Diseases of Metabolism at the St. Agnes Hospital, Philadelphia. Introduction by Morris Fishbein, M.D., Editor, Journal of the American Medical Association. With a foreword by George Morris Piersol, B.S., M.D., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Whittlesey House Health Series. Morris Fishbein, M.D., Editor. Cloth. Price, $2. Pp. 240, with 5 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1937.

This manual on diabetes is one of a series for the patient and the physician. It is well written, in a style easy for a patient to read. Any intelligent person can easily grasp the subject matter. It offers much also to the physician in general practice, who can well afford to read it. The summaries at the end of each chapter help to outline quickly the main points and should be of much help to the busy practitioner. Any one who knows its contents can practice diabetes in a rational manner. The book includes some of the most recent work in this subject and is therefore a handy compendium. A whole chapter is devoted to questions asked by the patient and the answers to them, which practically cover the subject. It is not a reference work but a practical manual.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Degree of Care to be Exercised by a Hospital.—An operation was performed on the appellee in the appellant hospital under spinal anesthesia. Prior to and during the operation an opiate, pantopon, was administered to the patient. Following the operation, the patient was returned to his room where, after an interval of approximately forty minutes during which time the attending physician was present, he was left in the care of a hospital nurse. Subsequently, about eighty minutes after the operation, the nurse left the room for five minutes to make some entries on a chart. During her absence, the patient fell from bed and fractured a thigh bone. In this suit against the hospital, the patient alleged that his injury was attributable to the negligence of the nurse in leaving him unattended. The jury returned a verdict for the hospital, but the trial court granted a new trial because it concluded that it had erroneously instructed the jury. The hospital then appealed to the Supreme Court of Alabama.

An instruction, said the court, was not erroneous which told the jury that, even if it constituted bad judgment on the nurse's part to leave the patient alone in the room, a finding for the patient would not be justified if the jury was reasonably satisfied from the evidence that the nurse did nothing more than any reasonably prudent, careful, skilled and diligent nurse would have done under the same or similar circumstances. It did not predicate negligence only on acts of commission and ignore acts of omission. The instruction clearly stated that, if the act of leaving the room was no more than any reasonably prudent, careful, skilled and diligent nurse would have done under like circumstances, the patient could not recover damages. But, said the court, an instruction was palpably erroneous that told the jury "unless you are reasonably satisfied from the evidence that the servants, agents or employees of defendant, in and about the treatment of Mr. Galloway, used the same degree of care, skill and diligence as used by hospitals generally in this community, then you cannot find for the plaintiff." This instruction told the jury not to find for the patient unless there was no negligence on the part of the hospital's employees. It was in direct contradiction of other instructions and at variance with the pleadings and all the evidence presented under the issues. This instruction, the court said, obviously did not express what was intended by counsel, and was given by the trial court through oversight.

The trial court instructed the jury that the hospital was required to exercise "the same degree of care, skill and diligence as used by hospitals generally in this community." The patient apparently contended that a greater degree of care was required, relying on the case of *Birmingham Baptist Hospital* v. *Branton*, 218 Ala. 464, 118 So. 741, in which it was said that a hospital was required to exercise "that degree of care, skill, and diligence used by hospitals generally in that community, *and by the express or implied contract of the undertaking.*" Broadly speaking, said the court in the present case, that care which persons of common prudence exercise under like conditions is the degree of care recognized by the courts throughout the country. This implies a care having regard to the conditions of the particular case and to the fact that the subjects of ministry are sick people. A hospital is liable for want of ordinary care, whether for incompetence of a nurse or failure of duty by a fully qualified nurse. The added expression in the Birmingham Baptist Hospital case, "and by the express or implied contract of the undertaking," is unquestionably correct and pertinent, said the court, in framing an inclusive statement of the law applicable to all cases. It does not, however, impose a greater degree of care, skill and diligence than that "used by hospitals generally in that community," unless there is some evidence of an express or implied contract imposing a higher obligation than that implied from the admission of a patient. There was no such contract in the present case. The hospital, continued the court, is not an insurer of the safety of a patient nor is the doctrine of res ipsa loquitur applicable to a case of this type.

The fact that undergraduate nurses are, by the practice of hospitals generally, put in charge of patients following operations in which anesthetics have been employed is not evidence of a want of ordinary care. Such practice must be left to the judgment of those specially qualified by experience and learning. If reasonable and ordinary care and skill are not employed in protecting the patient, the hospital is liable for the consequences, whether the employee in charge is a graduate or an undergraduate nurse. Under the evidence it was a question for the jury to determine whether or not the patient, to all reasonable appearances, had become sufficiently oriented to his surroundings for it to be safe to leave him alone for a few minutes.

Since the trial court did erroneously instruct the jury, its action in granting a new trial was affirmed.—*South Highlands Infirmary, Inc. v. Galloway (Ala.), 171 So. 250.*

Medical Practice Acts: Lectures on the Healing Art, with Incidental Demonstrations, not Practice of Medicine.—Hurley, being unlicensed, conducted a school of healing and incidental thereto gave class demonstrations of the application of the theory of healing he taught. Briefly, the central thought of his theory was that if the human body was restored or adjusted to the "center of gravity" and kept so the physical ills of mankind would largely cease. In demonstrating his conception of what would restore the center of gravity, Hurley would cause one of the class to present his nude back to the view of the remaining members of the class and to stand in relation to a plumb line suspended from the ceiling in line with his spinal column, so that departures of the body from gravity would be observable. In promoting restoration of the center of gravity of the body toward its normal, he would lightly touch the subject "on the muscle known as gluteus maximus, on the buttocks," and on other muscles, which he claimed would cause relaxation and induce return to normal. The whole result, he claimed, would be that ills having seat in abnormal distortions of the body, which he said exhausted the category of ailments, would yield to restore gravity. He did not treat individual cases nor did he treat other than in classes; he made no examination as to the physical condition of pupils entering or desiring to enter his classes and did not inquire of them as to whether they were suffering from any ailment. He made no diagnosis in any instance and assured all that his purpose was to teach a technic calculated to eliminate that which he claimed was the cause of all ills. He was convicted under an information which in separate counts accused him of practicing medicine and chiropractic, respectively, without a license. He appealed to the Supreme Court of Colorado.

Hurley, in the opinion of the Supreme Court, was engaged in the practice neither of medicine nor of chiropractic. He did not diagnose and gave no treatment to individuals. A person who does not diagnose does not practice medicine. He taught but one thing—the correct poise of the body and its beneficial effect on general health. He did not profess to cure *this* man of *that* disease, but *all* men of whatever ailment they suffered by imparting one principle of universal application. Furthermore, the practice of chiropractic is defined in Colorado as "the Science of locating and removing interference with nerve transmission." Hurley did nothing within that statutory definition. Nothing that Hurley did, said the court, was inimical to public health, safety, morals or general welfare. To forbid such teaching or to visit criminal prosecutions and penalties because of it would encroach not only on the teacher's right to engage in a lawful activity but on the rights of those who may wish to pursue the outlined course.

Considering the fact that in scientific, professional and legislative conception the schools of medicine and chiropractic are wholly different, continued the court, it is inconceivable that Hurley violated both statutes. His acts were in contravention of one or the other statute, or of neither, but not of both. The verdict of guilty returned on either count was equivalent to a verdict of not guilty on the other count. The two verdicts of guilt were at the same time verdicts of not guilty. They were inconsistent and repugnant. Each negatived the other.

The trial court, in the opinion of the Supreme Court, should have directed a verdict in favor of Hurley. The judgment of conviction was accordingly reversed.—*Hurley v. People (Colo.), 63 P. (2d) 1227.*

Malpractice: Limitation of Actions; Suit Based on Tort, Not on Contract.—The plaintiff instituted suit against the defendants, two physicians, Feb. 18, 1932, alleging that in December 1928 she was suffering from an illness due to some ailment of the uterus; that she verbally employed the defendants to diagnose and treat the condition; that they accepted the employment and agreed to use proper care and skill in diagnosing and treating her ailment; that they treated her until March 1, 1929, when they were discharged and another physician was employed; and that the defendants improperly and unskilfully treated her with radium and certain cauterizing agencies and medicine. The trial court overruled the defendants' demurrer to the evidence and they appealed to the Supreme Court of Kansas.

The sole question before the court was whether the action could be classified as one for damages for breach of an oral contract, to which a three year statute of limitations applied, or as one for damages for malpractice, to which a two year statute of limitations applied. If it were an action for damages for malpractice, it was agreed that the statute had run before the institution of the action and that the trial court should have sustained the demurrer. The evidence, said the Supreme Court, tended to show that the defendants were unskilful and negligent in their diagnosis; that under methods well known they could have determined whether the patient had cancer, but the methods were not used; that they were also unskilful and negligent in their treatment; and that bad results followed. Under this evidence it was clear to the court that the gravamen of the action was malpractice irrespective of any allegation or testimony tending to show a contract for treatment. The action, therefore, sounded in tort and the two year statute of limitations applied. The trial court should have sustained the demurrer. The Supreme Court accordingly directed the trial court to render a judgment for the defendants.—*Coulter v. Sharp (Kan.), 64 P. (2d) 564.*

Malpractice: Liability for Negligence of Hospital Nurse.—An operation was performed on the appellee at the appellant hospital, during which the patient suffered a "collapse." The operating physician, after directing that the patient be removed to her room and that a saline solution be injected, apparently left the hospital and was not thereafter connected with the case. Another physician, whose connection with the case is left in obscurity by the record, injected the saline solution, during the course of which injection a hospital nurse "without proven directions therefor" placed an unshielded light globe on the patient between her forearm and breast and covered it with a towel. Severe burns resulted for which the patient sued the hospital. From an adverse judgment, the hospital appealed to the Supreme Court of Oklahoma.

The hospital denied liability on the ground that the two physicians, not it, were responsible for the nurse's negligence. An operating physician, said the Supreme Court, during an operation is responsible for the acts of the attendants and nurses, although they are employees of the hospital. Likewise an operating physician is responsible for the negligence of nurses and attendants when he accompanies and attends the patient and directs treatment after the operation. But for a hospital thus to escape responsibility for the negligence of an employee in caring for a patient after an operation, it must appear that the operating physician "actually exercised supervision and control over the servants" of the hospital at the time of the negligence or lack of care. In the present case the patient was burned after the departure of the operating physician. The hospital insisted that the presence of the other physician in the room when the patient was burned relieved it of liability for the negligent act of the nurse. But, said the court, there was no evidence that this physician was employed by the patient to attend her at the hospital or that he had any authority from the patient to exercise any supervision and control over the servants of the hospital so as to relieve the hospital from liability. Furthermore, a physician who is working over a patient after an operation to save him from heart failure is not responsible for the negligence of a nurse who burns the patient, it being clear that where an immediate emergency requires all of the physician's attention, he must leave details to the nurse. *Marchand* v. *Bertrand,* Rap. Jud. Quebec, 39 C. S. 49, found in Quebec Official Law Reports, vol. 39, p. 49, 1910; 60 A. L. R. 152. Again, a physician is relieved from liability for the negligence of nurses and attendants furnished by a hospital when such negligence is not known or discoverable by the physician in the exercise of care and skill by him. *Harris* v. *Fall,* 177 F. 79, 27 L. R. A. (N. S.) 1174.

The hospital also contended that the patient had recovered a judgment against the operating surgeon and the physician who administered the saline solution and that that case was determinative as to the absence of liability on the part of the hospital for the negligence of the nurse. The court, however, refused to consider that judgment as determinative of the hospital's liability because the hospital was not a party to the prior case and because in that case it could not have well been determined whether the hospital had complied with its contract to provide plaintiff competent servants, ordinary care and protection.

For the reasons stated, the judgment in favor of the patient was affirmed.—*Flower Hospital v. Hart (Okla.), 62 P. (2d) 1248.*

Society Proceedings

COMING MEETINGS

Academy of Physical Medicine, Philadelphia, Oct. 19-21. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 10-15. Dr. W. P. Wherry, 107 South Seventeenth St., Omaha, Executive Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 20-22. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 20-22. Dr. Daniel B. Moss, 547 W. Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, Baltimore, Oct. 11-13. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Chicago, Oct. 25-29. Dr. George W. Crile, 40 East Erie Street, Chicago, Chairman, Board of Regents.

American Congress of Physical Therapy, Cincinnati, Sept. 20-24. Dr. Richard Kovacs, 1100 Park Ave., New York, Secretary.

American Public Health Association, New York, Oct. 5-8. Dr. R. M. Atwater, 50 West 50th St., New York, Executive Secretary.

Association of American Medical Colleges, San Francisco, Oct. 24-26. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, Los Angeles, Oct. 14-16. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Association of Obstetricians and Gynecologists, Dallas, Texas, Oct. 14-16. Dr. Ralph A. Reis, 104 South Michigan Blvd., Chicago, Secretary.

Clinical Orthopaedic Society, Chicago, Oct. 14-16. Dr. H. Earle Conwell, 215 Medical Arts Bldg., Birmingham, Ala., Secretary.

Colorado State Medical Society, Colorado Springs, Sept. 22-25. Mr. Harvey T. Sethman, 537 Republic Building, Denver, Executive Secretary.

Delaware, Medical Society of, Wilmington, Oct. 12-13. Dr. W. H. Speer, 917 Washington St., Wilmington, Secretary.

Indiana State Medical Association, French Lick, Oct. 4-6. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, St. Louis, Oct. 18-22. Dr. W. B. Peck, 27 E. Stephenson St., Freeport, Ill., Managing Director.

Michigan State Medical Society, Grand Rapids, Sept. 27-30. Dr. L. Fernald Foster, 311 Center Ave., Bay City, Secretary.

Mississippi Valley Medical Society, Quincy, Ill., Sept. 29-Oct. 1. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Ely, Sept. 24-25. Dr. Horace J. Brown, 120 N. Virginia St., Reno, Secretary.

New York State Association of Public Health Laboratories, Albany, Oct. 29. Miss M. B. Kirkbride, New Scotland Avenue, Albany, N. Y. Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 17-22. Dr. J. D. McCarthy, 107 South Seventeenth Street, Omaha, Secretary.

Oregon State Medical Society, Salem, Oct. 21-23. Dr. Morris L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 4-7. Dr. Walter F. Donaldson, 500 Penn Avenue, Pittsburgh, Secretary.

Vermont State Medical Society, St. Johnsbury, Oct. 14-15. Dr. A. B. Soule Jr., Mary Fletcher Hospital, Burlington, Secretary.

Virginia, Medical Society of, Roanoke, Oct. 12-14. Miss A. V. Edwards, 1200 East Clay St., Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

14: 1-126 (July) 1937

Some Remarks on Technic in Clinical Electrocardiography with Precordial Derivation. K. H. Larsen, Copenhagen, Denmark.—p. 1.

Rational Principle for Connections of Leads of Electrocardiograph in Clinical Electrocardiography with Precordial Derivation. K. H. Larsen and E. J. Warburg, Copenhagen, Denmark.—p. 7.

Heart Murmurs: From the Point of View of an Actuary. A. Hunter, New York.—p. 10.

Hemodynamic Studies in Experimental Coronary Occlusion: III. Denervated Heart Experiments. M. Mendlowitz, G. Schauer and L. Gross, New York.—p. 21.

Electrocardiographic Changes in Acute Pericarditis: Clinical and Pathologic Study. J. B. Vander Veer and R. F. Norris, Philadelphia.—p. 31.

Circulation Time of Blood of Dogs, Determined by Ionization (Geiger Counter) Methods: I. Effects of Physicophysiologic Agents and of Drugs. E. C. McCracken, H. E. Essex and C. Sheard, Rochester, Minn.—p. 51.

Id.: II. Effects of Digestion. E. C. McCracken, H. E. Essex and C. Sheard, Rochester, Minn.—p. 60.

*Electrocardiography in Infants and Small Children: Suggestions on Technic. R. E. Glendy and Margaret M. Glendy, Boston.—p. 66.

Characteristic Serial Changes in Fourth Lead After Acute Coronary Thrombosis. M. A. Feinstein and A. Lieberson, New York.—p. 69.

Duration of Systole in Hypocalcemia. P. S. Barker, F. D. Johnston and F. N. Wilson, Ann Arbor, Mich.—p. 82.

Postural Effects on Blood Pressure Following Interruption of Vasomotor Nerves of Man. Grace M. Roth, Rochester, Minn.—p. 87.

Electrocardiography in Small Children.—The Glendys use the following modifications in electrocardiographic studies in children: Sanborn redux paste was used as the contact material in applying the electrodes, which were placed on the dorsum of the forearms, on the anterior fleshy portion of the left lower leg and at the cardiac apex to record the chest lead, the leg electrode being left in place as the indifferent electrode. The sites of application, after being cleansed with alcohol, were rubbed gently with a small amount of redux paste and a daub of paste the size of a small pea was smeared on each electrode before it was put in place. The electrodes on the extremities hold firmly in place when the metal ring on one end of the retaining strap is placed over the central post of the electrode at its base and the loose end carried round the extremity and adjusted to the proper snugness by sinking the sharp point of the post into the elastic webbing. Similarly, in applying the electrode to the chest, one of the larger openings at one end of the rubber strap is placed over the base of the central post of the electrode; the strap is then carried round the chest and the electrode made fast by placing one of the many small holes over the tip of the post.

14: 127-254 (Aug.) 1937

Effect on Circulation of Mechanical Occlusion of Individual Arteries of the Extremities: Relation to Arterial Embolism. R. E. McKechnie and E. V. Allen, Rochester, Minn.—p. 127.

Approach to Diagnosis of Congenital Heart Disease. T. J. Dry, Rochester, Minn.—p. 135.

Chest Lead Tracings in Arterial Hypertension with Cardiac Enlargement. I. R. Roth, New York.—p. 155.

Coronary and Extracoronary Factors in Hypertensive Heart Failure. H. Gross and C. Spark, New York.—p. 160.

Auricular Paroxysmal Tachycardia (Possibly Nomotopic) with Variable Auriculoventricular Conduction Time: Study of a Case of Exceptional Duration with Gradual Slowing of the Heart Rate. K. Maddox, Sydney, Australia.—p. 183.

*Puberty and Prognosis in Rheumatic Fever. M. Leonard, New Haven, Conn.—p. 192.

Effects of Epinephrine on the Heart. G. Milles and P. W. Smith, Chicago.—p. 198.

Production by Epinephrine of ST Changes in the Electrocardiogram of the Cat, Similar to Those of Coronary Occlusion. A. H. Douglas, B. Gelfand and C. Shookhoff, Brooklyn.—p. 211.

Anomalous Origin and Course of the Left Coronary Artery in a Child: So-Called Congenital Absence of the Left Coronary Artery. S. Sanes, Buffalo.—p. 219.

Apparent Increased Velocity of Blood Flow in Cases of Congenital Heart Disease with Septal Defects Having Right-to-Left Shunt. J. McGuire and F. Goldman, Cincinnati.—p. 230.

New Apparatus for Recording Heart Sounds. E. W. Hollingsworth, L. M. Sorensen and A. Van den Driessche, Hines, Ill.—p. 236.

Prognosis in Rheumatic Fever.—Leonard studied the relationship of age to susceptibility and resistance in rheumatic fever in 500 patients who had sustained one or more known attacks of rheumatic fever. Just as first attacks of rheumatic fever show a sharp decline in frequency preceding the age of puberty, so also do recurrent (second or third) attacks show a decline during or just after the same age period. Factors responsible for this decline will probably remain unknown as long as the pathogenesis of rheumatic fever remains obscure, but two influences were evinced which seem to contribute to it. One of these is that since there is a sharp decline in primary attacks before puberty there will be a sharp decline in recurrent attacks during the years immediately following, for recurrent attacks are more apt to follow a primary attack. However, this is not entirely responsible for the improvement noted at puberty, for another contributing factor is apparent in the analysis of groups of patients who had sustained their first attacks at different periods of childhood. A gradual decrease in susceptibility occurs, which covers the ten year period following the ages of 7 to 9 years. These two factors then, and possibly others, chance to coincide at about the age of puberty to cause a distinct lessening of the number of recurrences. The recognition of this improvement at the age of puberty is of some value in prognosis.

American Journal of Anatomy, Philadelphia

61: 1-158 (May) 1937

Cytologic Changes in Rat Thyroid Following Exposure to Heat and Cold, and Their Relationship to Physiology of Secretion. R. N. Baillif, Minneapolis.—p. 1.

Observations on Structure of Nephron in Common Eel. A. L. Grafflin, New Haven, Conn.—p. 21.

Observations on Migration of Neural Crest Cells, and on Development of Spinal Ganglions and Vertebral Arches in Amblystoma. S. R. Detwiler, New York.—p. 63.

Meningeal Relations of Hypophysis Cerebri: II. Embryologic Study of Meninges and Blood Vessels of Human Hypophysis. G. B. Wislocki, Boston.—p. 95.

Genito-Urinary System of Elephas Indicus Male. T. L. Schulte, San Francisco.—p. 131.

American Journal of Pathology, Boston

13: 497-678 (July) 1937

*Pathology and Pathogenesis of Clinical Acute Nephritis. E. T. Bell, Minneapolis.—p. 497.

Parathyroid Hyperplasia in Chronic Renal Insufficiency. B. Castleman and T. B. Mallory, Boston.—p. 553.

Response of Guinea-Pig Bone Marrow to Liver Extract. E. A. Gall, Boston.—p. 575.

Pathogenesis of Cortical Necrosis of Kidneys in Rabbits Following Injection of Staphylococcus Toxin. J. H. Glynn, Montreal.—p. 593.

Clinical Acute Nephritis.—Bell includes under the term "clinical acute nephritis" all cases of acute renal disease that exhibit a definite impairment of renal function indicated by retention of nitrogenous products, decreased ability to excrete phenolsulfonphthalein, inability to form a concentrated urine, loss of large amounts of protein in the urine, bleeding from the parenchyma of the kidney and severe oliguria or anuria. The 110 cases of acute nephritis that were available for study were subdivided into groups in accordance with the structural changes in the kidneys. There were thirty-one cases of uncomplicated acute glomerulonephritis and twenty cases in which the nephritis was associated with another disease. In the normal glomerulus and in subclinical glomerulonephritis it may be seen that all the capillaries of the lobules are completely invested with a basement membrane, but in clinical glomerulonephritis the capillaries within the lobule become fused together and their inner basement membranes split to form the characteristic intracapillary fibers. The lesions are all intracapillary. In five cases uremia was due to numerous massive lesions of the embolic type, in the absence of endocarditis. Eleven cases are reported in which the principal symptoms were septicemia, hematuria and uremia. This is called the hemorrhagic type of glomerulonephritis. Albuminuria, hematuria and edema of renal origin are evidences of glomerular injury; tubular disease is evidenced by oliguria and anuria. In rare instances acute uremia is due to multiple thromboses of small renal arteries.

Occasionally tubular nephritis is due to other causes than mercury bichloride poisoning. The acute uremia following transfusion with incompatible blood is due chiefly to obstruction of the collecting tubules by casts of hemoglobin. There is a group of cases in which uremia seems to be partly of extrarenal origin and partly due to distention of the convoluted tubules with minor degenerative changes in their lining cells. In purely extrarenal uremia the kidneys are normal and the azotemia is due chiefly to dehydration and to increased destruction of protein. Decrease of blood chloride is apparently not a cause of azotemia. The azotemia of diabetic coma is due in part to tubular injury in some instances.

American Journal of Tropical Medicine, Baltimore

17: 457-638 (July) 1937

Geographic Distribution of Immunity to Yellow Fever in Man in South America. F. L. Soper, Rio de Janeiro, Brazil.—p. 457.
Possible Significance of Low Blood Pressures Observed in Guatemalans and in Yucatecans. G. C. Shattuck, Boston.—p. 513.
Resistance of Endamoeba Histolytica Cysts to Chlorine in Aqueous Solutions. W. S. Stone, Washington, D. C.—p. 539.
Morphologic and Serologic Relationships of Various Fungi Causing Dermatitis Verrucosa (Chromoblastomycosis). N. F. Conant and D. S. Martin, Durham, N. C.—p. 553.
Trichomoniasis (Trichomona Columbae) in the Java Sparrow, Tovi Parrakeet and Verrauz's Dove. G. R. Callender and J. S. Simmons, Ancon, Canal Zone.—p. 579.
Invasion of Submucosa of Human Small Intestine by Ancylostoma Braziliense. C. Bonne, Batavia, Java.—p. 587.
Yellow Fever in Venezuela in 1929. E. I. Benarroch, Caracas, Venezuela.—p. 595.
Splenomegaly in Experimental Monkey Malaria. L. T. Coggeshall, New York.—p. 605.
Studies on Vitamin G Deficiency in Monkeys. H. G. Johnstone and A. C. Reed, with technical assistance of Margaret K. Iverson, San Francisco.—p. 619.

American Review of Tuberculosis, New York

36: 1-162 (July) 1937

The Clinic, the Laboratory and the Field: Address of the President. E. R. Long, Philadelphia.—p. 1.
Ulcerative Tuberculosis Tracheobronchitis. J. B. Barnwell, J. Littig and J. E. Culp, Ann Arbor, Mich.—p. 8.
Bronchiectasis: Analysis of Its Causes. P. M. Andrus, London, Ont.—p. 46.
Size of the Heart in Pulmonary Tuberculosis: Report of 400 Cases. R. E. Porter and W. H. Gordon, Fort Stanton, N. M.—p. 82.
Tuberculin Allergy Produced by Parenteral BCG Vaccination. Camille Kereszturi, H. A. Rosenberg and W. H. Park, New York.—p. 90.
Treatment of Pulmonary Tuberculosis with Gold Sodium Thiosulfate. M. Tess, Koch, Mo.—p. 100.
*Pneumoperitoneum in Treatment of Pulmonary Tuberculosis: Preliminary Report. H. G. Trimble, Oakland, Calif., and B. H. Wardrip, San Jose, Calif.—p. 111.
Effect of Splenectomy on Tuberculous Infection in Mice. Jessie Marmorston, New York.—p. 119.
Certified Diagnosis of Tuberculosis: Further Practical Studies on Detection of Tubercle Bacilli. M. Greenberg and M. L. Cohn, Denver.—p. 126.

Pneumoperitoneum in Treatment of Pulmonary Tuberculosis.—The pregnant tuberculous woman suggested to Trimble and Wardrip the possible value of pneumoperitoneum in pulmonary tuberculosis, which reproduces the mechanical effects of pregnancy. The amount of elevation of the diaphragm even during the latter months of pregnancy may be only from 2 to 3 cm., but it is apparently sufficient to be of benefit to pulmonary lesions. If the amount of elevation caused by pregnancy is of value, one can be quite certain that the amount obtained by the use of pneumoperitoneum will also be helpful because as much as two or three times this amount can be obtained. The greatest degree of collapse has been obtained by the use of pneumoperitoneum in conjunction with phrenic nerve paralysis. With the addition of subphrenic pressure by pneumoperitoneum, the paralyzed leaf of the diaphragm may rise sufficiently to reduce the volume of the lung to as little as one third of its original volume. The amount of diaphragmatic rise varies with the individual, but a rise to as high as the third interspace anteriorly on each side has been noted from pneumoperitoneum alone. The elevation of the diaphragm was a little greater with the patient in the upright position; also, if the patient was on one side constantly, the uppermost hemidiaphragm was more affected. Consequently, when pneumoperitoneum is used in conjunction with phrenic nerve paralysis, the patient is kept on his good side. This, of course, is contrary to the procedure when a patient is placed at postural rest or on a bolster. The technic of pneumoperitoneum is very similar to giving pneumothorax refills. To date three far advanced cases have been made sputum negative. Cough and sputum have frequently been diminished and the patient made more comfortable. Cavities that have failed to close by any other available procedure have been closed by pneumoperitoneum. This is particularly true of basilar cavities. In one case it was effective in closing a large subclavicular cavity which had been present for two years. The beneficial psychologic effect on these patients for whom previously there was little to offer has been marked.

Annals of Internal Medicine, Lancaster, Pa.

11: 1-266 (July) 1937

Recent Knowledge Concerning Influenza. R. E. Shope, Princeton, N. J.—p. 1.
Clinical Investigations of Insulins with Prolonged Activity. R. M. Wilder, Rochester, Minn.—p. 13.
Hematopoietic Liver Principle. G. E. Wakerlin, Louisville, Ky.—p. 31.
Hematopoietic Response Following Oral Administration of Desiccated Duodenal Mucosa. J. C. Thompson, Lincoln, Neb.—p. 39.
Origin of Paroxysmal Tachycardias as Determined by the Esophageal Electrogram. A. M. Harvey, Baltimore.—p. 57.
Studies on Experimental Hypertension: V. The Pathogenesis of Experimental Hypertension Due to Renal Ischemia. H. Goldblatt, Cleveland.—p. 69.
*Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi). S. Weiss and R. W. Wilkins, Boston.—p. 104.
Chronic Bilateral Pyelonephritis: Its Origin and Its Association with Hypertension. W. T. Longcope, Baltimore.—p. 149.
Primary Inflammation of Arteries. H. T. Karsner, Cleveland.—p. 164.
Healed Bacterial Endocarditis. L. Hamman, Baltimore.—p. 175.
Psychobiology of Breathing. C. Binger, New York.—p. 195.

Nature of Cardiovascular Disturbances.—To determine whether cardiovascular disturbances in nutritional deficiencies exist as a clinical problem, Weiss and Wilkins investigated the records of some 900 patients suffering from various types of nutritional deficiency, including general malnutrition, chronic alcoholism with or without polyneuritis, pellagra, neuritis of pregnancy and diabetes. There were eighty-five cases in which cardiovascular dysfunction of varying severity could not be ascribed to the usual etiologic factors. Because all instances in which organic lesions of the cardiovascular system existed were eliminated and because many of the cases were observed by physicians not experienced in cardiovascular problems, the number selected must be considered minimal. This conclusion is corroborated by the fact that within a period of two years the authors have personally studied thirty-five patients from a total of 5,506 admissions to two general medical services in this hospital. The observations here presented are therefore based on a total group of 120 cases. The cardiovascular disturbances caused by nutritional deficiencies do not form a rigid clinical syndrome. Right and left ventricular failure, arteriolar dilatation and increased blood flow, peripheral circulatory collapse and shock, singly or in combination, have been observed. The onset of the disease may be sudden or gradual. Patients with the severe form of the disease show a tendency to fever, to bronchopneumonia and to acute fatal circulatory collapse. Under therapeutic measures such as rest, cardiac drugs, diets rich in vitamin B_1 or crystalline vitamin B_1, all the cardiovascular disturbances usually revert to normal. The clinical symptoms and signs, the blood chemistry, the myocardial changes, the hemodynamics and therapeutic responses correspond to those described in "beriberi heart" in the Orient. The disease as observed in Boston, however, is characterized by more varied and more generalized involvement of the cardiovascular system. Vitamin B_1 deficiency plays a primary part in the precipitation of the disease. Alcohol also is a significant factor, not only because it supplies calories without vitamin B_1 but also because its metabolic effect is similar to that of a pure carbohydrate. The rate of response to vitamin B_1 in "alcoholic" and "nonalcoholic" beriberi varies. The arteriolar system shows a more rapid change than the heart. The cardiovascular disorder usually disappears before the polyneuritis. The condition described bears pertinently on the clinical behavior and the mortality rates of alcoholic and nonalcoholic patients with vitamin B deficiencies (beriberi and pellagra). It may explain the poor reaction of these patients to increases in metabolic rate, such as occur in febrile infections, in hyperthyroidism or under surgical operations.

Annals of Medical History, New York

9: 293-400 (July) 1937

John Davidson Godman. W. S. Miller, Madison, Wis.—p. 293.
Art, History and the Crutch. S. Epstein, New York.—p. 304.
Medical Degrees Conferred in the American Colonies and in the United States in the Eighteenth Century. F. C. Waite, Cleveland.—p. 314.
The School of Salerno and Surgery in the North During Saga Age. I. Reichborn-Kjennerud, Oslo, Norway; translated by Anna Tjomsland, New York.—p. 321.
The History of Steam Sterilization. T. B. Magath, Rochester, Minn.—p. 338.
Notes on Medical History of Vienna. H. M. Korns, Iowa City.—p. 345.
The Doctor on the Stage: Medicine and Medical Men in Seventeenth Century English Drama. H. Silvette, University, Va.—p. 371.

Archives of Dermatology and Syphilology, Chicago

36: 247-474 (Aug.) 1937

*Distinctive Exudative Discoid and Lichenoid Chronic Dermatosis: Nine Cases. M. B. Sulzberger, New York, and W. Garbe, Toronto.—p. 247.
Primary Basal Cell Epithelioma of Extremities: Review of Literature and Report of Thirty-Two Additional Cases. W. Sachs, Jersey City, N. J., and W. Garbe, Toronto.—p. 273.
Phenolphthalein Compounds. G. H. Belote and H. A. K. Whitney, Ann Arbor, Mich.—p. 279.
Necrobiosis Lipoidica Diabeticorum (Urbach): Comparison with Granuloma Annulare. J. C. Bernstein, Baltimore.—p. 282.
Significance of Pigments in Nutrition and Metabolism. J. E. Klein, Normal, Ill.—p. 287.
*Smallpox Vaccine in Treatment of Recurrent Herpes Simplex. P. D. Foster, Los Angeles, and A. B. Abshier, New York.—p. 294.
Specific Chemical Medium for Pathogenic Fungi. W. H. Southworth, Boston.—p. 302.
Keratoma Palmare et Plantare Hereditarium, with Especial Reference to Its Mode of Inheritance as Traced in Six and Seven Generations, Respectively, in Two Chinese Families. Huei-Lan Chung, Peiping, China.—p. 303.
Chronic Urticaria, Recurring Every Six Weeks, Due to Fungous Infection. G. L. Waldbott and M. S. Ascher, Detroit.—p. 314.
Lymphogranuloma Venereum: Prolonged Derangement of Serum Lipids and Proteins: Preliminary Report. I. Rosen, H. Rosenfeld and Frances Krasnow, New York.—p. 318.
Electrophoretic Mobility of Erythrocytes in Syphilis. J. A. F. Pfeiffer and K. P. Dozois, Baltimore.—p. 321.
The Birth of Syphilis. V. Robinson, New York.—p. 325.
Resistant Erosive Lesions in Pachyonychia Congenita of Jadassohn: Treatment with Buffered Cysteine Hydrochloride. L. C. Goldberg, Cincinnati.—p. 331.
Dermatomycosis of Guinea-Pigs. M. S. Shahan, Washington, D. C.—p. 335.
Early Sign of Latent Allergy in Infants. I. N. Kugelmass, New York.—p. 342.
Simplified Office Photography. F. Ronchese, Providence, R. I.—p. 344.
Samuel Plumbe. T. Rosenthal, New York.—p. 348.

Exudative Discoid and Lichenoid Chronic Dermatosis.—Sulzberger and Garbe observed nine cases of distinctive exudative discoid and lichenoid chronic dermatitis. The condition has been confined to men of the Jewish race, appearing during the fourth or fifth decade of life. The onset of the dermatosis has usually been sudden; the generalized eruption was sometimes preceded by a circumscribed dermatitis which was irritated by treatment. The foreground of the picture is dominated by pruritus—by the intractable and uncontrollable itching with its nocturnal accentuation and its frequent veritable crises. The general health remained to a great extent unimpaired throughout, if the transitory loss of weight and the irritability and fatigue are accepted as presumably due to the severe subjective sensations and to the ensuing sleeplessness. The most characteristic objective lesions were sharply demarcated oval and discoid plaques showing rapid variations in consistency and appearance; these plaques were at times flat and scaly, elevated and edematous or oozing and crusting; they would speedily pass through many of the clinical stages considered characteristic of eczematous lesions. The brief oozing surfaces of the plaques, and particularly the delicate and often punctate crusts (status punctosus) allowed one to infer that exudation and at least histologic vesiculation had been present. The oozing yielded more or less rapidly to topical therapy or underwent spontaneous involution, recurring, however, either spontaneously or after bouts of scratching and irritation. In all nine cases the more persistent lesions in the form of certain circumscribed disks and plaques, as well as certain diffusely affected areas, seemed at times to be definitely infiltrated; and at these times the picture was suggestive of a premycotic eczema or of some other leukotic dyscrasia. Although no part of the skin could be considered entirely immune to the discoid and oval lesions, there was an obvious preference for extensor, as compared with flexor, surfaces, and the perimamillary areas, the anterior and posterior aspects of the axillary folds, the scrotum, the circumoral region, the bridge of the nose, the abdomen and the scapular areas. On the trunk, the long axes of the oval lesions showed a consistent tendency to follow the lines of cleavage. Besides these disks and oval plaques, all the patients presented the lichenoid phase and the phase resembling the premycotic stage of mycosis fungoides. Marked cutis anserina and diffuse follicular involvement, with often persistent somewhat follicular papules like those of lichen planus, were observed in all but one case. Other manifestations which compelled attention were the frequent and often persistent erection of the nipples in seven cases, the edema and swelling and even the complaint of "soreness" of the mamillae and perimamillary areas (seven cases). The usual methods of therapy and superficial application of unfiltered roentgen radiation in the usual dose seemed only to aggravate the condition. Except in one case, removal of certain evident foci of infection was not followed by cure or even by any definite alteration in the course of the disease. On the other hand, hospitalization and certain other changes of environment repeatedly resulted in marked improvement in all but one case. Histologic observations did not enable them to characterize the disease clearly, nor did they permit the classification of the cutaneous lesions as those of any known definite dermatologic entity. In none of the cases were there changes diagnostic of dermatitis herpetiformis, of lichen planus, of mycosis fungoides, of other leukotic dyscrasias or of any other dermatologic entity. The only permissible conclusion seems to be that the process was exudative and inflammatory, favoring the blood vessels, being most severe in the upper layers of the cutis and in the papillary bodies and being accompanied by eczematoid changes in the epidermis.

Smallpox Vaccine in Treatment of Recurrent Herpes Simplex.—Foster and Abshier treated thirty-five patients for frequently regular recurrent herpes simplex, by vaccination with variola (smallpox) vaccine. Each patient was vaccinated approximately four times at intervals of two weeks unless a take was noted, in which case the reaction was allowed to subside before the treatment was continued. Among this group five takes were noted. The majority gave reactions of immunity which subsided after the interval of two weeks. A follow up after two years showed that in four there had been slight recurrences and in one, no result. This gives a 14 per cent ratio of recurrence. Treatment was not attempted in patients with concomitant diseases, such as pneumonia, known drug eruptions or herpes menstrualis. Treatment with vaccine is suggested as an effective means of combating a comparatively insignificant yet troublesome eruption.

Archives of Otolaryngology, Chicago

26: 1-126 (July) 1937

Climate and Upper Respiratory System. C. C. Charlton, Atlantic City, N. J.—p. 1.
Osteomyelitis of Skull: Comparison of Two Cases Observed Seventeen and Fourteen Years Ago with Two Observed in Past Two Years. F. T. Hill, Waterville, Maine.—p. 9.
Prognosis in Laryngeal Tuberculosis. J. B. Greene, Asheville, N. C.—p. 18.
Cholesteatoma of Frontal Sinus. G. M. Coates, Philadelphia.—p. 29.
Nasopharyngeal Abscesses and Cysts. F. D. Woodward, University, Va.—p. 38.
Suppuration of Petrous Pyramid: Some Views on Its Surgical Management. M. C. Myerson, New York.—p. 42.
Method of Draining Cerebral Abscesses. J. M. Robison, Houston, Texas.—p. 49.
Meningitis Due to Hemolytic Streptococcus: Report of Two Cases with Recovery After Use of Prontosil and Sulfanilamide. H. B. Smith and E. H. Coon, Hempstead, N. Y.—p. 56.
Etiology, Prophylaxis and Treatment of Surgical Septicemia: Discussion of Principles Involved. J. A. Kolmer, Philadelphia.—p. 59.
Small Doses of Insulin in Otolaryngologic Practice: Clinical Experience of Correspondence Study Group. D. C. Jarvis, Barre, Vt.—p. 66.
Dysphemia and Dysphonia: Cardinal Features of Three Types of Functional Syndrome: Stuttering, Aphonia and Falsetto (Male). J. S. Greene, New York.—p. 74.
Iritis Caused by Asymptomatic Sphenoiditis with Anomaly of Sphenoid Sinuses. J. J. Pressman, Los Angeles.—p. 83.
Acute Streptococcic Edema of Larynx with Secondary Atelectatic Pneumonitis. J. B. Price, Norristown, Pa.—p. 87.
Use of Benzedrine Inhaler for Children. E. S. Vollmer, Philadelphia.—p. 91.
Acute Labyrinthitis with Complicating Late Facial Paralysis: Report of Case. A. Hilding, Duluth, Minn.—p. 93.
Tumors of Nose and Throat. G. B. New, Rochester, Minn., and W. Kirch, Des Moines, Iowa.—p. 96.

Archives of Surgery, Chicago

35: 211-418 (Aug.) 1937

Origin of Fetal Adenoma in Thyroid Gland. W. B. Murphy and G. Ahnquist, New York.—p. 211.
Experimental Joint Sprain: Pathologic Study. L. J. Miltner, C. H. Hu and H. C. Fang, Peiping, China.—p. 234.
Subphrenic Abscess: Original Extrapleural Operation. G. L. McWhorter, Chicago.—p. 241.
Injection of Ether into Biliary Tract as Treatment for Choledocholithiasis. J. G. Probstein and C. T. Eckert, St. Louis.—p. 258.
Carcinoma of Infrapapillary Portion of Duodenum. M. M. Lieber, H. L. Stewart and H. Lund, Philadelphia.—p. 268.
Experimental Peptic Ulcer Produced by Cinchophen: Methods of Production, Effect of Mechanical Irritant and the Life History of the Ulcer. L. K. Stalker, J. L. Bollman and F. C. Mann, Rochester, Minn.—p. 290.
*Cerebriform Nevus Resembling Cutis Verticis Gyrata. G. Hammond and H. K. Ransom, Ann Arbor, Mich.—p. 309.
Fractures of the Ankle. G. Apfelbach and L. Boim, Chicago.—p. 328.
Retroperitoneal Teratoma. P. M. Mecray Jr. and W. D. Frazier, Philadelphia.—p. 358.
Treatment of Compound Fractures: Results in 100 Cases of Compound Fractures of Tibia. E. H. Caldwell, New York.—p. 368.
A Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn., and V. J. O'Conor, Chicago.—p. 373.

Cerebriform Nevus Resembling Cutis Verticis Gyrata.—Hammond and Ransom report two cases of cerebriform nevus of the scalp resembling cutis verticis gyrata which constitute a condition distinctly different, both clinically and pathologically, from all the other types of cutis verticis gyrata. Since this condition presents so few features in common with cutis verticis gyrata, they suggest that it be removed from this classification and designated as cerebriform nevi of the scalp. In the literature and textbooks this convoluted nevus is referred to as cutis verticis gyrata when it occurs on the scalp but as nevus cerebriformis or cerebelliformis when it occurs elsewhere on the surface of the body. Cutis verticis gyrata should be considered only a descriptive term (Madden) and it should be generally understood that several different pathologic processes in the scalp may result in the formation of convolutions and furrows. In any patient exhibiting cutis verticis gyrata, a careful differential diagnosis should be made to determine the underlying cause so that appropriate treatment can be recommended. The authors believe that Masson has shown rather conclusively that a nevus represents a proliferation of the chromatophores, tactile corpuscles and nerve cells, forming the end apparatus of the sensory nerve filaments of the skin. There seems to be little doubt of the relationship of the nevus to the neurofibroma. The results of the histopathologic study in the two cases reported support Masson's concept of the neurogenic nature of the nevus. The differences of opinion among different writers as to the most satisfactory form of treatment of a nevus is noted. The methods of therapy range from the application of the electric needle, solid carbon dioxide, cautery, caustics, radium and liquid air to electrolysis, roentgen irradiation, endothermy, electrodesiccation and electrocauterization. It is believed that the best form of treatment is complete surgical excision.

Canadian Public Health Journal, Toronto

28: 311-362 (July) 1937

Public Health Yesterday, Today and Tomorrow. M. R. Bow, Edmonton, Alta.—p. 311.
Some Aspects of the Management of the Diabetic Patient. W. R. Campbell, Toronto.—p. 318.
Public Health and the Traffic Accident Problem. N. L. Burnette, Ottawa, Ont.—p. 327.
The Rural Health District. G. M. Little, Red Deer, Alta.—p. 333.
*Ascorbic Acid Content of Milk. E. J. Reedman, Toronto.—p. 339.
Communicable Disease Control in Scarborough Township, Ontario. C. D. Farquharson, Agincourt, Ont.—p. 341.

Cevitamic Acid Content in Milk.—Reedman determined the cevitamic acid content of milk from four breeds of dairy cows. The acid content varied little between breeds or among the animals of the same breed and, further, little variation was noted in the stages of lactation or with the age of the cattle. The cevitamic acid content of milk was found to decrease gradually on storage. Samples of raw milk cooled immediately to 5 C. and stored in the dark retained approximately 75 per cent of the original value after forty-eight hours. Added cevitamic acid behaved similarly. Only reduced cevitamic acid is found in fresh raw milk stored in the dark. It would seem that cevitamic acid oxidase is absent, or present in very small amounts in milk. Milk pasteurized thirty minutes by the holder method retained more than 70 per cent of the original vitamin C content. Buttermilk, whey, powdered whole milk and evaporated milk contain a small amount. Raw skimmed milk averages 2.5 mg. of cevitamic acid per hundred cubic centimeters, while skimmed milk powder may contain as much as 26.7 mg. per hundred grams if dried by the Just drum method. It is true that milk alone will not supply sufficient vitamin C in the diet, but it is equally true that it would not normally be required to do so. As an average, a pint of milk may be said to contain 10 mg. of cevitamic acid after pasteurization. The nutritional value of milk is practically unchanged by properly conducted pasteurization.

Florida Medical Association Journal, Jacksonville

24: 1-80 (July) 1937

Hypoglycemic Shock Therapy in Dementia Praecox. H. M. Smith, Tampa.—p. 11.
Summary of Present Status of Fever Therapy Produced by Physical Means. K. Phillips, Miami.—p. 20.
The Battle of the Children. R. H. Williams, Eustis.—p. 22.
The School Child. A. B. McCreary, Jacksonville.—p. 25.
Hypersensitive People. S. C. Colley, Tavares.—p. 27.
The Romance of Medicine. L. Orr, Orlando.—p. 30.
The Christian Fathers and Medicine. S. A. Shoemaker, Orlando.—p. 33.
The Early Teachings in Anatomy and Circulation of Blood. J. S. McEwan, Orlando.—p. 36.
Medical Ethics. L. W. Martin, Sebring.—p. 40.
America's Menace. F. D. Bartleson, Fort Myers.—p. 42.
Heart Pain. E. W. Bitzer, Tampa.—p. 45.
Holiday Hazards. W. W. Jones, Dade City.—p. 47.
Immunization. S. C. Harvard, Brooksville.—p. 49.
X-Ray in Early Diagnosis. J. N. Moore, Ocala.—p. 52.
Prenatal Care. C. F. Ahmann, Gainesville.—p. 54.
Responsibility of Laity to Indigent. J. S. Turberville, Century.—p. 57.
Childbirth. W. C. Roberts, Panama City.—p. 58.

Georgia Medical Association Journal, Atlanta

26: 355-398 (July) 1937

Story of Vitamins in Infant Nutrition. I. A. Abt, Chicago.—p. 355.
Importance of Tropical Medicine to Southern Physicians. C. F. Craig, New Orleans.—p. 364.
Sex Hormones in Gynecology: Clinical Value of Present Preparations. E. C. Hamblen, Durham, N. C.—p. 368.
Medicine in a Changing Era. E. H. Greene, Atlanta.—p. 375.
Practical Aspects of Human Genetics in Medicine. J. Krafka Jr., Augusta.—p. 378.

Journal of Allergy, St. Louis

8: 427-522 (July) 1937

Limitation of Passive Transfer in Food-Sensitive Children. R. Chabot and G. Hurwitz, New York.—p. 427.
Observations on Transmission of Passive Anaphylactic Sensitivity in the Guinea-Pig. M. B. Cohen and B. H. Woodruff, Cleveland.—p. 437.
Anaphylaxis and Vitamin C. J. van Niekerk, Weesp, Holland.—p. 446.
Investigations in Passive Transfer Experiments. A. Romanoff and G. Brooks, New York.—p. 450.
Protein Nitrogen Unit for Standardization of Inhalant Extracts for Diagnosis and Treatment of Allergic Diseases. A. Stull, R. A. Cooke and Mary Glidden, New York.—p. 454.
Optimal Doses in Pollen Therapy. G. L. Waldbott and M. S. Ascher, Detroit.—p. 457.
Incidence and Importance of Tree Pollen Hay Fever, with Particular Reference to Philadelphia and Vicinity. L. Tuft and G. Blumstein, Philadelphia.—p. 464.
Critical Analysis of Animal Dander Reactions. S. E. Rynes, Philadelphia.—p. 470.
Effects of Adrenalin on Skin Reactions. O. Swineford Jr., University, Va., and P. T. Grove, New Orleans.—p. 475.
Incidence of Air-Borne Fungus Spores: I. Alternaria. O. C. Durham, North Chicago, Ill.—p. 480.
Statistical Analysis of Leukopenic Index. C. J. Sullivan, Richmond, Va.—p. 491.
*Skin Tests with Bacterial Products in Arthritic and Nonarthritic Individuals. E. F. Traut, Chicago.—p. 501.

Skin Tests with Bacterial Products.—Traut made intradermal injections of whole bacteria and the supernatant broth of their forty-eight hour cultures into patients with chronic rheumatoid arthritis and into allergic and nonallergic controls. Previous observations of increased tendency of arthritic patients to react to streptococci or their products were confirmed. Hemolytic streptococci again gave the most marked and most frequent reactions. The increased cutaneous sensitivity was limited to streptococci. The staphylococci and gram-negative organisms did not similarly affect the skin of arthritic patients. None of the observations justified the assumption of a specific

organism. A history of hay fever, asthma, urticaria or eczema profoundly affects the results of tests with the supernatants of broth cultures. The number of positive tests is directly proportional to the content of irritant, nonspecific substances. This nonspecific irritant factor renders valueless skin tests of an individual with unstandardized autogenous bacterins or other autogenous bacterial products not previously standardized by tests on control individuals.

Journal of Biological Chemistry, Baltimore

119: 389-820 (July) 1937. Partial Index

Distribution of Fat in Livers of Depancreatized Dogs Maintained with Insulin. I. L. Chaikoff and A. Kaplan, Berkeley, Calif.—p. 423.

Factors Influencing Destruction of Glucose and Fructose by Oxygen. M. Clinton Jr. and R. S. Hubbard, Buffalo.—p. 467.

Determination of Bilirubin with Photo-Electric Colorimeter. Helga Tait Malloy and K. A. Evelyn, Montreal.—p. 481.

Study of "Ascorbic Acid Oxidase" in Relation to Copper. E. Stotz, C. J. Harrer and C. G. King, Pittsburgh.—p. 511.

Chemistry of Lipids of Tubercle Bacilli: XLVIII. Occurrence of Phthiocerol in Wax from Various Strains of Human Tubercle Bacillus. R. E. Reeves and R. J. Anderson, New Haven, Conn.—p. 535.

Isolation of Pregnane-3, 17, 20-Triol from Urine of Women Showing Adrenogenital Syndrome. G. C. Butler and G. F. Marrian, Toronto. —p. 565.

Fructose Content of Spinal Fluid. R. S. Hubbard and Nellie M. Russell, Buffalo.—p. 647.

*Simple Method for Determination of Acetone in Blood and Urine. J. C. Abels, New York.—p. 663.

Estimation of Cystine in Finger Nail Clippings with Hydrolysis for One Hour. M. X. Sullivan, H. W. Howard and W. C. Hess, Washington, D. C.—p. 721.

Observations on Proteolytic Activity of Serums of Dogs with Experimental Uremia. M. F. Mason and R. Evers, Nashville, Tenn.—p. 735.

Relation of Protein to Hemoglobin Building. P. B. Pearson, C. A. Elvehjem and E. B. Hart, Madison, Wis.—p. 749.

*Variations in Lipemia of Normal Subjects. Evelyn B. Man and E. F. Gildea, New Haven, Conn.—p. 769.

Determination of Acetone in Blood and Urine.—The reagents that Abels uses for determining acetone in the blood and urine are a 5 per cent solution of sodium bisulfite in water, Nessler's solution, a 1:1 dilution by volume of sulfuric acid and a standard acetone solution. A stock solution containing 0.1 mg. per cubic centimeter of acetone is prepared and checked gravimetrically by the method of Van Slyke. The standard solutions used are made by a 1:10 dilution of this, so that 1 cc. contains 0.01 mg. This should be prepared daily. The apparatus consists of a 50 cc. Erlenmeyer flask and a tightly fitting cork. Suspended from the under surface of the cork by means of a pin (6 cm. long) is a cotton pencil (dental roll). The pin is stuck first through the cotton plug and then into the cork. The urine is made acid to congo red with 1:1 sulfuric acid, and 0.5 cc. is pipetted onto the cotton roll. In the case of the blood, no previous acidification is necessary, and the 0.5 cc. sample may be used directly. Five-tenths cc. of the 5 per cent sodium bisulfite solution is spread over the bottom of the flask and the cork is carefully and firmly inserted so as to allow the blood or urine sample to suspend about 1 cm. over the level of the bisulfite. The flask is heated in a boiling water bath for fifteen minutes and, when cool, the cork and cotton roll are removed, 1 cc. of water is added and then 1 cc. of Nessler's solution, bringing the total volume to 2.5 cc. The solution is poured into a test tube (6 inches by one-half inch) and the amount of turbidity is compared with the standard set. The standards are prepared at the same time in similar test tubes from 0, 0.002, 0.004...0.01 mg. of actone, water to 1 cc., 0.5 cc. of 5 per cent sodium bisulfite, and 1 cc. of Nessler's solution. The full development of the turbidity takes fifteen minutes, during which time the tubes should be shaken occasionally. If exposed as little as possible to the light, they keep for about twenty-four hours. When abnormal amounts of acetone are suspected in the blood or urine, a stronger set of standards containing 0, 0.005, 0.01...0.05 mg. of acetone should be prepared.

Variations in Lipemia of Normal Subjects.—Man and Gildea determined the serum cholesterol, phosphatides, fatty acids and generally the total protein, albumin and globulin content of six women and four men between 24 and 45 years of age at intervals throughout a total length of time of from three months to four years. The intervals between blood studies were irregular in four persons, were of two weeks duration throughout three months in two men and two women, and then were prolonged to approximately one month in one man and two women. Such timing of the blood studies has permitted investigation of the level of serum lipids in relation to the season of the year, to the menstrual cycle of women and to the constancy of lipemia after intervals as prolonged as one and one-half years in two subjects, two and one-half years in one man and four years in one woman. There was a wide range in the serum cholesterol, lipoid phosphorus, titrated fatty acids and total protein of any one person. The minimal and maximal serum cholesterols varied by as much as 31 per cent, lipid phosphorus by 23 per cent, titrated fatty acids by 37 per cent and proteins by 14 per cent. Differences in lipids were not related to changes in hemoconcentration when serum proteins were employed as a criterion of blood volume. Variations in lipids were not related to slight changes in body weight. In women the course of serum cholesterol could not be correlated with the menstrual cycle, and, moreover, changes in the cholesterol of men exceeded those in women. No definite trend in serum lipids in relation to the season of the year could be traced from person to person.

Journal of Immunology, Baltimore

33: 1-86 (July) 1937

Response of Infants to Inoculation with Type I Pneumococcus Carbohydrate. J. A. V. Davies, Boston.—p. 1.

Influence of Urethane on Anaphylactic Reactions: Contribution to Dale's Theory of Anaphylaxis. L. Farmer, New York.—p. 9.

Presence of M Agglutinogens in Blood of Monkeys. K. Landsteiner and A. S. Wiener, New York.—p. 19.

Studies on Serum Fractions: III. Precipitation of Antibody by Precipitin-Serum. K. Ando, K. Manako, R. Kee and S. Takeda, Darien, Manchuria.—p. 27.

Id.: IV. Fractions Absorbed from Immune Horse Serum by Specific Antigen. K. Ando, with technical assistance of K. Takeshima, Darien, Manchuria.—p. 41.

Bactericidal Power of Blood and Protection Against Meningococcic Infection. N. Silverthorne, with technical assistance of C. Cameron, Toronto.—p. 51.

The Nature of Antibodies. S. B. Hooker, Boston.—p. 57.

Influence of Temperature on Anaphylaxis in Guinea-Pigs Passively Sensitized with Globulins of Types I and II Antipneumococcus Horse Serum and Shocked with Type Specific Carbohydrates. G. H. Bailey and S. Raffel, Baltimore.—p. 75.

Journal of Nutrition, Philadelphia

14: 111-222 (Aug.) 1937

Individual Variations in Susceptibility to Dietary Deficiency. A. L. Bloomfield, San Francisco.—p. 111.

"Latent Deficiency" in Rats: Variations in Weight Loss on Repeated Feeding of Defective Diet. L. R. French and A. L. Bloomfield, San Francisco.—p. 117.

*Further Studies on Growth Promoting Factor Associated with Summer Milk. G. O. Kohler, C. A. Elvehjem and E. B. Hart, Madison, Wis. —p. 131.

Undernutrition, Starvation and Phagocytosis. E. Gellhorn and J. O. Dunn, Chicago.—p. 145.

The Rôle of Manganese and Certain Other Trace Elements in Prevention of Perosis. H. S. Wilgus Jr., L. C. Norris and G. F. Heuser, Ithaca, N. Y.—p. 155.

Effect of Vitamin E Deficiency on Growth. Gladys A. Emerson and H. M. Evans, Berkeley, Calif.—p. 169.

Basal Metabolism of Rats in Relation to Old Age and Exercise During Old Age. F. G. Benedict and H. C. Sherman, with collaboration of H. L. Campbell and Anna Zmachinsky, New York.—p. 179.

Effect of Vitamin B Deficiency on Heat Production of Rat. L. Voris, State College, Pa.—p. 199.

Further Contribution to Derivation of Factors for Computing Gaseous Exchange and Heat Production in Metabolism of Proteins. M. Kriss and L. Voris, State College, Pa.—p. 215.

Growth Factor in Summer Milk.—Kohler and his collaborators attempted to demonstrate the identity factor found in grass juice with known vitamins. A series of supplements was fed to rats receiving mineralized winter milk ad libitum. Growth was stimulated by daily supplements of 3 Gm. of fresh grass, 3 cc. of grass juice, 0.6 Gm. of dried oat grass, 0.2 Gm. of rice bran or 0.2 Gm. of liver extract. The known essential food factors as well as flavine, choline, goat milk factor and alcohol-ether precipitate factor have been eliminated from consideration as being the active principles, by the inferior responses to growth produced by daily doses of 2 drops of cod liver oil, 1 cc. of orange juice, 0.5 Gm. of brewers' yeast, 0.25 Gm. of dried brain and 1 Gm. of defatted wheat germ. Increased growth of rats on mineralized winter milk receiving a supplement of grass or grass juice over that of controls receiving no supplement is accompanied by an increase in the consumption of milk. Fresh or carefully dried tissues of green plants con-

tain a substance (or substances) which is the limiting factor for growth of rats on mineralized winter milk. The activity of the tissues of fresh plants may be demonstrated by use of the expressed juice. The daily dose of juice necessary to produce optimal growth is 0.1 Gm. on the dry weight basis. Other supplements produced slight increases in growth over the controls. Von Wendt has published work which indicates that the seasonal variation in the nutritive quality of milk is of importance in human nutrition in territories in which milk and its products are the chief articles of diet.

Laryngoscope, St. Louis

47: 365-434 (June) 1937

Anatomy and Physiology of the Neural Mechanism of Hearing: Physiology of Hearing and Anatomy of the Inner Ear. S. R. Guild, Baltimore.—p. 365.
Id.: Sensory Endings in Cochlea. R. Lorente de Nó, New York.—p. 373.
Id.: Central Auditory Pathways to Temporal Lobes. J. C. Hinsey, New York.—p. 378.
Id.: Point of View of the Physicist. H. Fletcher, New York—p. 389.
Pathology of the Neural Mechanism of Hearing: Perilymphatic and Endolymphatic Systems. B. J. Anson, Chicago.—p. 395.
Id.: The Pathology of Nerve Deafness. F. H. Lewy, Philadelphia.—p. 409.
Id.: Pathology of the Organ of Corti. M. H. Lurie, Boston.—p. 418.
Motor Disorders of Central Nervous System and Their Significance for Speech: Part II. Clinical Forms of Motor Defects (The "Spastic Child"). P. J. Zentay, St. Louis.—p. 421.

Military Surgeon, Washington, D. C.

80: 411-484 (June) 1937

Standard Technic for Bacteriologic Examination of Eating Utensils. J. G. Cumming and N. E. Yongue.—p. 411.
Gonococcic Endocarditis. J. O. Gillespie and R. M. Thompson.—p. 418.
Severe Gunshot Wound of Face. R. F. Dorset.—p. 429.
Mosquito Control Program. C. L. Leedham.—p. 431.
*Shock. H. P. Makel.—p. 436.
Appendicitis Following Tonsillitis and Respiratory Infections. G. R. Dawson Jr.—p. 447.
Interpretation of Normal Blood Pressures and Pulse Rates in Routine Physical Examinations. H. G. Armstrong.—p. 456.

Shock.—Makel declares that, to save life, not only must shock be recognized when the classic symptoms are present, but conditions causing, and signs indicating, the probability of secondary shock must be known and proper prophylaxis given. Once shock has developed, treatment must be instituted without delay: "The critical level of blood pressure once reached, it will not rise again without assistance." The best guide as to the procedure to be followed is the degree of shock present as determined by depression of the blood pressure. Mild shock responds quickly to measures directed toward increasing body heat, the relief of pain and free oral administration of fluid and avoidance of movement. In severe shock the indication is to increase immediately the diminished blood volume. The intravenous administration of physiologic solution of sodium chloride to which dextrose is added usually results in an immediate restoration of the blood pressure. The most effectual means of restoring a diminished blood volume is transfusion of blood. In the domain of surgical technic there is need of greater gentleness in handling the tissues and of more painstaking care in eliminating every factor contributing to shock. The use of powerful mechanical retractors, the neglect of hemostasis, the unnecessary bruising of organs and traction on them are all too common. The surgeon should shrink from needless trauma as he would from the conscious introduction of infection. Food and water deprivation and exposure to cold increase the ease with which shock can be produced. Prolonged anesthesia may greatly exaggerate the condition. Treatment may be summarized thus: removal of all contributing causes. These are not only associated with physical trauma but include psychic and nervous aberrations. Drugs and agencies to stimulate and maintain blood pressure should be used.

New England Journal of Medicine, Boston

217: 123-160 (July 22) 1937

Treatment of Septic Compound Fractures of Tibia with Maggots. S. Maddock and Dorothy Jensen, Boston.—p. 123.
Hypoglycemia Due to Insulin. A. Marble, Boston.—p. 130.
Chickenpox Encephalitis: Report of Case. C. F. Walcott, Boston.—p. 136.
Progress in Pediatrics. R. C. Eley, Boston.—p. 137.

New Orleans Medical and Surgical Journal

90: 1-54 (July) 1937

Head Injuries. C. P. Gray and C. P. Gray Jr., Monroe, La.—p. 1.
Practical Tuberculosis Case-Finding Program. R. A. Brown, Montgomery, Ala.—p. 6.
Modern Trends in Public Health Work in Louisiana. W. K. Sharp, Jr., New Orleans.—p. 8.
Lymphogranuloma Inguinale (Lymphopathia Venerea). J. W. Tedder, New Orleans.—p. 13.
Superior Pulmonary Sulcus Tumor: Report of Case. A. Mayoral and I. H. Wilson, New Orleans.—p. 20.
Lung Abscess: Report of Case in a Child. P. C. DeVerges, New Orleans.—p. 25.
Macrodactylism. J. D. Bloom, New Orleans.—p. 29.
*Local Use of Quinine in Ophthalmology. G. W. Robinson, New Orleans.—p. 30.
Lateral Pyelogram as an Aid in Diagnosis of Perinephric Abscess: Preliminary Report. J. G. Menville, New Orleans.—p. 37.

Local Use of Quinine in Ophthalmology.—During the last six months Robinson has used quinine bisulfate in solutions and ointments (2 per cent) in the treatment of catarrhal conjunctivitis and has found its results most gratifying. In fifteen cases so treated, the conjunctival infection decreased by one half within two days, on the average. Exudates from such eyes examined microscopically after one week were found to be sterile. The average case cleared up in from seven to ten days. The disease process was longer in being brought under control when the solution was used. The use of a 2 per cent quinine bisulfate ointment along with the use of atropine as a postoperative treatment in ten cases of pterygium has greatly reduced scarring when compared with the records of cases in which such treatment had not been used. Similar results were observed in a number of postoperative cataract cases in which the intracapsular method with a corneal suture was employed. Ethylhydrocupreine hydrochloride in solutions of from 0.5 to 1 per cent has been used in seventy-five cases of pneumococcic conjunctivitis, proved with the microscope, during the last year and in less than 3 per cent of these cases the drug did not halt the condition. Ten patients with hordeola, after removal of the dead hair and evacuation of the exudate, were placed on 0.5 per cent ethylhydrocupreine to be used thrice daily and in no case was there any sign of conjunctivitis seen at any time. Although ethylhydrocupreine and quinine as ocular therapeutic agents are still in their experimental stage, the author states that both drugs are highly beneficial in their effects on infectious micro-organisms of the conjunctiva and the repair of ocular adnexa, and that they act synergistically with each other and are not hampered by the use of their supposed antagonistic drugs such as mercury, iodides, bromides, lead, zinc, copper and ammonia, and that the two drugs may be combined over long periods without producing injury to any of the ocular adnexa.

Oklahoma State Medical Assn. Journal, McAlester

30: 243-280 (July) 1937

Surgical Pediatrics. G. E. Stanbro, Oklahoma City.—p. 243.
Bilateral Acute Mastoiditis with Many Complications: Recovery. M. D. Henley, Tulsa.—p. 247.
Operative Procedures of Nose for Cosmetic Purposes. C. von Wedel, Oklahoma City.—p. 249.
Hyperpyrexia as a Therapeutic Measure. S. C. Shepard, Tulsa.—p. 252.
*Infantile Eczema. H. A. Foerster, Oklahoma City.—p. 260.
Treatment of Gonorrhea in the Male. D. W. Branham, Oklahoma City.—p. 262.

Infantile Eczema.—Foerster declares that the following conditions must be ruled out before one has the true atopic variety of infantile eczema: dermatitis seborrhea, infectious eczema, fungus infection and contact dermatitis. When these conditions or types of eczema are eliminated, then and only then is one qualified to call the case one of atopic or true infantile eczema. The treatment of (atopic) infantile eczema is usually of a dual nature; that is, local soothing measures and that which is directed toward finding the cause. The three most important things to test for are milk, egg and wheat, as these are the basis of most infant diets. An infant genuinely sensitive to cow's milk cannot take boiled, acidified or any form of canned cow's milk without keeping the eczema flared up. The author advises putting these infants on a goat's milk formula. Breast fed infants are usually egg sensitive, the condition being transmitted through the mother's milk. Eggs should be eliminated from the diet, care being taken that the

infant or mother does not get traces of egg in cake, bread, custard, pretzels and the like. Often milk sensitive infants are barley sensitive, and many of the soya bean milk preparations contain barley; this may be the explanation of failure of soya bean milk substitutions to help the eczema. Atopic infants, if followed closely, all have an allergic background, and one can expect from 50 to 75 per cent to continue to develop new sensitivities as they grow older and as more foods are added to their diet; they progress to the stage of neurodermatitis and later pass into the asthmatic and hay fever category. Therefore it behooves one to follow these cases carefully from year to year and to be cautious with regard to a too favorable prognosis.

Physiological Reviews, Baltimore

17: 335-484 (July) 1937

Rôle of Fat in Diet. W. E. Anderson, New Haven, Conn., and H. H. Williams, Detroit.—p. 335.
Drugs Affecting Parasympathetic Nerves. V. E. Henderson and M. H. Roepke, Toronto.—p. 373.
Physical Factors Involved in Activities of Mammalian Kidney. F. R. Winton, Cambridge, England.—p. 408.
Fatigue in Mental Work. A. G. Bills, Chicago.—p. 436.
Reversible Inactivations of Certain Hydrolytic Enzymes. L. Hellerman, Baltimore.—p. 454.

Public Health Reports, Washington, D. C.

52: 989-1026 (July 23) 1937

Some Factors Which Affect Relationship Between Housing and Health. J. M. DallaValle.—p. 989.
Age of Gainful White and Negro Male Workers of the United States, 1920 and 1930: Studies on Age of Gainful Workers No. 4. W. M. Gafafer.—p. 999.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

12: 369-498 (June) 1937

Study of Parasite Control in Puerto Rico Over a Period of Five and a Half Years. G. W. Bachman, R. Rodriguez Molina, W. A. Hoffman and J. O. González, San Juan.—p. 369.
Health and Socio-Economic Studies in Puerto Rico: I. Health and Socio-Economic Conditions on Sugar Cane Plantation. P. Morales Otero, M. A. Pérez, R. Ramírez Santos, Rafaela Espino, Adriana Ramú, J. L. Fuster, Dolores González and M. Marrero, San Juan.—p. 405.

South Carolina Medical Assn. Journal, Greenville

33: 161-184 (July) 1937

The South Carolina Workmen's Compensation Law. J. H. Dukes, Columbia.—p. 161.
*Amebic Abscess of Liver. J. R. Young and L. J. Bristow, Anderson, —p. 164.

Amebic Abscess of Liver.—Young and Bristow review the cases (twenty-five) of amebic abscess of the liver that have occurred among the last 34,994 admissions. Of the patients admitted for primary pathologic changes of the liver 37 per cent, or one in three, had amebic abscess. A past history suggestive of amebiasis was obtained in only thirteen patients, and only six had a diarrhea on admission to the hospital. The relatively high incidence of persons who have an amebic abscess of the liver with no antecedent history of a dysentery is explained by the fact that slight amebic infections limited to the right half of the intestine may not produce diarrhea, while the same degree of infection in the left half may produce symptoms; and the nearer the rectum is approached by the infection, the more pronounced are symptoms produced. Only five patients had received emetine previous to the present illness. If used oftener, amebic abscesses would be less frequent. From the histories, as nearly as could be determined, the average duration of symptoms was more than twenty-one weeks, the extremes being eighteen months for the longest and two weeks for the shortest. In reviewing the symptoms as presented, pain and/or tenderness in the region of the liver and fever occurred in all cases. Pain in the upper right quadrant associated with an enlarged, tender liver and a sallow, muddy skin should make one suspicious of amebic hepatitis, whether or not the patient gives a history of a past diarrhea. The other most frequently noted symptoms were loss of weight and vomiting in fifteen cases, chills in thirteen and sweats in ten, while seven patients gave the history of having pain in the right shoulder. All the patients had a secondary anemia. Stool examinations are helpful only when positive, and a negative stool by no means rules out amebiasis. Roentgenoscopy is one of the most important and reliable diagnostic aids, especially fluoroscopy, where elevation and fixation of the right leaf of the diaphragm is a constant occurrence. The treatment of amebic abscess of the liver consists of specific therapy, closed drainage (aspiration), open drainage, or a combination of these methods. As soon as the diagnosis is made or suspected, 0.065 Gm. of emetine daily for from six to ten days is given. If the patient is not relieved, the abscess should be emptied by aspiration. If aspiration is not done or is not successful, open drainage of the abscess by the transpleural or abdominal approach is indicated, depending on where the abscess is "pointing." No matter what method of drainage is used, emetine should be given to every patient having abscess of the liver.

Southern Surgeon, Atlanta, Ga.

6: 267-350 (Aug.) 1937

Improvements in Operative Treatment of Intestinal Carcinoma. W. W. Babcock, Philadelphia.—p. 267.
Problems in Osteomyelitis. J. S. Gaul, Charlotte, N. C.—p. 275.
Small Bowel Tumors, with Especial Reference to Melena. F. W. Rankin and A. E. Grimes, Lexington, Ky.—p. 280.
Evaluating Functional Element in Diagnosis and Treatment of Surgical Diseases. J. M. Donald, Birmingham, Ala.—p. 288.
Inexpensive "Traction Irons," for Well Leg Countertraction, Without Use of Bone Pins. H. C. Dozier, Ocala, Fla.—p. 293.
Observations on Early Diagnosis of Gastro-Intestinal Cancer. E. Jelks, Jacksonville, Fla.—p. 299.
Pylorospasm as an Entity in Diagnosis. E. D. Mitchell Jr., Memphis, Tenn.—p. 305.
Present Status of Surgery of Ovary. H. L. Rush and L. V. Rush, Meridian, Miss.—p. 314.
Benign Tumors That Destroy the Patient. C. D. Lucas, Charlotte, N. C.—p. 319.
Serious Complications of Gallbladder Disease. W. R. Meeker, Mobile, Ala.—p. 330.

Surgery, St. Louis

2: 1-162 (July) 1937

Uretero-Intestinal Implantation. C. C. Higgins, Cleveland.—p. 1.
Implantation of Ureters into the Colon. W. Walters, Rochester, Minn.—p. 12.
*Aseptic Ureterosigmoidostomy: New Method Providing Definite Asepsis in Respect of Both Fecal and Urinous Soiling: Preliminary Report. F. E. B. Foley, St. Paul.—p. 18.
Rhabdomyosarcoma of Kidney: Case Report with Autopsy Findings. W. J. Messinger and W. D. Jarman, Rochester, N. Y.—p. 26.
Effects of Obstruction of Common Bile Duct on Portal Blood Flow and Oxygen Consumption. S. E. Levy and A. Blalock, Nashville, Tenn.—p. 33.
Cholecystoscopy. H. G. Hollenberg and W. C. Eikner, Clifton Springs, N. Y.—p. 37.
Use of Metycaine in Spinal Anesthesia. E. B. Tuohy, Rochester, Minn. —p. 39.
Effect of Sympathectomy on Peripheral Vascular Disease. G. de Takats, Chicago.—p. 46.
Arterial Repair by Muscle Transplants. R. W. McNealy and P. F. Shapiro, Chicago.—p. 61.
Surgical Complications During Pregnancy at the Chicago Lying-In Hospital. W. J. Dieckmann, Chicago.—p. 71.
Treatment of Carcinoma of Cervix by Combined Use of Relatively Small Amounts of Radium and Deep X-Ray. D. R. Murphey Jr., Tampa, Fla.—p. 82.
Surgical Correction of Mandibular Protraction, Retraction and Fractures of Ascending Rami. G. C. Hensel, San Francisco.—p. 92.
Calcification of Semilunar Cartilages of Knee Joint. I. Balensweig and D. M. Bosworth, New York.—p. 120.

Aseptic Ureterosigmoidostomy.—Foley devised an aseptic method of uretero-intestinal anastomosis. It is definitely aseptic in respect of both fecal and urinary soiling. It involves use of a new snare or guillotine instrument within the intestinal lumen but imposes no technical elaborations or difficulties. The ligated end of the ureter, pushing a small invaginated tent of intestinal submucosa before it, is inserted into the snare. The two structures are held in the grip of the snare while the ureter is embedded in the intestinal wall by suture and the abdomen is closed, all of which is accomplished without even a suture needle penetrating the lumen of either intestine or ureter. Later, with supply of a cutting current to the instrument, the snare amputates within the intestinal lumen the ligated end of the ureter and the invaginated tent of intestinal submucosa covering it, thus establishing the uretero-intestinal communication. The new instrument has been called a ureteral transplanter.

West Virginia Medical Journal, Charleston

33: 289-340 (July) 1937

Value of Sedimentation Rate in Medicine. O. B. Biern, Huntington. —p. 289.
Gastro-Intestinal Allergy. A. H. Hoge, Bluefield.—p. 296.
Diagnosis and Treatment of Trichomonas Vaginalis Vaginitis. C. John, Morgantown.—p. 302.
Internal Derangements of Knee. H. A. Swart, Charleston.—p. 304.
Personality Panel in History. E. F. Reaser, Huntington.—p. 310.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

49: 293-346 (July) 1937

Relapsing Phlyctenular Dermatitis of Extremities: Case (Dore). W. N. Goldsmith, with histologic account by W. Freudenthal.—p. 293.
*Three Clinical Types of Ringworm Due to Trichophyton Gypseum. Eleanor Silver Dowding and H. Orr.—p. 298.
Neuropathic Eczema. E. Ramel.—p. 307.

Ringworm Due to Trichophyton Gypseum. — Dowding and Orr set out to estimate the prevalence of Trichophyton gypseum in Alberta and to describe the clinical varieties of ringworm it may produce. Trichophyton gypseum was identified by the gross appearance of the cultures and by the size and shape of the spores, particularly the macroconidia. During 1935 and 1936, tissue from about 200 patients was examined in potassium hydroxide solution for fungal infection and, from the tissue containing fungi, cultures were obtained whenever possible. It was found that the commonest dermatophyte was Trichophyton gypseum, which was responsible for 67 per cent of the ringworm. Sixteen cultures of dermatophytes were obtained which were identified with certainty as Trichophyton gypseum. Of the sixteen isolates, seven of them were derived from lesions of the arm, five from chronic, scaly, sometimes vesicular lesions of the skin of the feet and four strains were derived from deep-seated inflammatory lesions—one from kerion of the scalp and three from pustular, boggy, granulomatous-like lesions of the beard. Only seven of the sixteen strains resembled published descriptions of the species in every particular. The seven identical strains were responsible for a variety of clinical types of ringworm; vesicular lesions of the glabrous skin; chronic scaly lesions of the feet; pustular boggy lesions of the beard. Furthermore, both typical and atypical cultures of Trichophyton gypseum have been isolated from each of the types of ringworm, so that no correlation could be found between the type of lesion produced by the fungus on the patient and any peculiarities in the appearance of the culture on Sabouraud's medium. The most obvious variations in the cultures of Trichophyton gypseum were in the color of the mycelium and in the pigmentation of the culture medium on which it grows.

British Journal of Radiology, London

10: 501-572 (July) 1937

Visualization of Pulmonary Artery by X-Rays. E. L. Rubin.—p. 501.
Distribution of Gamma Rays Round Ring Source. J. E. Roberts and Joan M. Honeyburne.—p. 515.
New Viewing Lantern. W. V. Mayneord.—p. 527.
Contribution of Radiology to the Cancer Problem. J. H. D. Webster.—p. 529.
*Some Histologic Changes Produced in Mammalian Brain by Exposure to Radium. H. A. Colwell and R. J. Gladstone.—p. 549.
The Size of the Living Heart: Additional Note. J. H. Barrett.—p. 564.
Absorption of X-Rays by the Skin. H. L. Brose and E. H. Molesworth.—p. 567.

Changes Produced in Brain by Exposure to Radium.—The changes in the brain that Colwell and Gladstone observed in their investigation of rat brains after exposure to radium were those of a nonsuppurative reactionary inflammation: 1. Immediate effects of irradiation were vascular engorgement and changes in the nerve cells, more especially the larger cells of the cortex of the hemispheres and cerebellum, and in the basal ganglions, pons and medulla oblongata. Frequently two adjacent cells of similar type in the same microscopic field exhibit marked contrast in the degree of damage that has been inflicted. 2. With lapse of time no attempt at repair was observed. On the contrary, degenerative changes have taken place in the damaged cells and are progressive. Adjacent cells continue to show the same contrasts, especially with regard to staining reactions. The staining reactions of the altered cells consist chiefly of the coloring of the cell body and nucleus, with the hematoxylin-eosin method, a deep purple. The stain is diffuse in distribution, coloring the broken down granular material of the cell body and chromatin material of the nucleus, and the matrix of the cytoplasm and nucleoplasm. 3. These changes are similar to those occurring in the area of hemorrhages or mechanical injuries, such as may occur in removal of the brain immediately after death. 4. The vascular dilatation that follows immediately after irradiation is accompanied by the escape of red blood corpuscles. 5. Twenty-four hours after irradiation the initial stages of inflammation of the membranes are accentuated and there is some proliferation of the vascular endothelium and a perivascular accumulation of small round cells. There are also signs of localized stases. 6. Evidences of inflammatory reaction, which are seen in the earlier stages, progressively increase with the lapse of time and are attended by disintegration and total destruction of nerve cells and occasional hemorrhages into the nerve tissue and ventricles of the brain; in some situations there is contraction of arterioles with interference of the vascular supply, and patches of necrosis in the affected areas.

British Medical Journal, London

2: 49-100 (July 10) 1937

*Partial Gastrectomy: Review of 320 Cases. N. C. Lake.—p. 49.
Tests for Renal Function. C. S. D. Don.—p. 54.
Causes and Treatment of Retained Placenta. D. Currie.—p. 57.
Ocular Headache. D. S. Stewart.—p. 59.
Luminal and Prominal in Epilepsy: Comparative Study. C. G. Millman.—p. 61.
Prominal in Treatment of Epilepsy. C. J. Henderson.—p. 63.

Partial Gastrectomy.—Lake declares that in the last ten years there have been two peaks of medical interest in gastrectomy: the reintroduction of intensive alkalinization and recently treatment by histidine. The lesions for which the operation has been performed in his 320 cases under review were gastric, duodenal, pyloric and jejunal ulcers and carcinoma. Some of the gastric ulcer cases had progressed to hour glass contraction (eleven cases), some of the pyloric and duodenal ulcers had caused obstruction with dilatation of the stomach (twelve cases), and some of the jejunal ulcers had previous gastric operations (perforation ten cases, gastro-enterostomy eight cases, local excision two cases). In a considerable proportion of instances the ulcers have been multiple. A majority of the cases (198) have been followed for more than two years, and only fifteen of these are unsatisfactory. The after history of some cases has been studied for periods up to fifteen years after operation. The gross mortality from all causes was 9.5 per cent in ulcer cases, 14.8 per cent in anastomotic ulcers and 14 per cent in carcinoma. If an ulcer is situated in the pyloric region, the mortality of the operation is but 5.3 per cent. The commonest causes of postoperative death are lung complications and peritonitis. The incidence of jejunal ulceration after partial gastrectomy is less than 2 per cent. No cases of postoperative pernicious anemia are recorded, but a microcytic anemia of mild degree is occasionally seen. The general permanent results in the ulcer cases are probably better than those obtained by any other method of treatment. The average duration of life in the carcinoma cases after operation was two and one-fourth years, but some patients with extensive growths lived for as long as seven and nine years.

East African Medical Journal, Nairobi

14: 79-118 (June) 1937

Cutaneous Epithelioma in an Albino African. W. A. Bullen.—p. 80.
Duodenal Ulcer in Zanzibar. S. M. Vassallo.—p. 83.

Edinburgh Medical Journal

44: 433-496 (July) 1937

Communism as Anthropologic Phenomenon. W. R. D. Fairbairn.—p. 433.
Clinical Recollections and Reflections: XV. Treatment of Acute Pleural Empyema. W. J. Stuart.—p. 446.
Interpretation and Significance of Gordon's Test in Diagnosis of Hodgkin's Disease: Study of 100 Cases. C. E. Van Rooyen.—p. 455.
Certain Types of Alimentary Neurosis. P. C. McKinlay.—p. 465.
*Microscopic Inquiry into Etiology of Measles. A. C. Coles.—p. 483.

Inquiry into Etiology of Measles.—Coles examined films of the secretions or blood from fourteen cases of measles and in nearly all cases definite and distinctive red stained virus-like bodies have been found, not unlike but slightly larger than the Buist bodies of vaccinia. As far as he can see, the only structures that might be mistaken for these bodies are the escaped granules of cells. In the blood of measles the leuko-

cytes and especially the polymorphonuclears are diminished in number. When once the eye has become accustomed to the distinctive appearance of these bodies, their dissimilarity from cell granules is quite obvious. The virus-like bodies of measles are to be found in fluids like that of lacrimal secretion, in which cells are scanty or absent; especially is this the case in preparations made from the breath or an infected handkerchief. It is impossible at this stage to state definitely that the elementary bodies described are the actual causal virus of measles, but they certainly more closely represent a filtrable organism than anything yet described.

Indian Medical Gazette, Calcutta

72: 329-392 (June) 1937

Myeloid Leukemia: Treatment by Deep X-Rays. L. Everard Napier, P. C. Sen Gupta and R. N. Chaudhuri.—p. 329.
Cobra Venom in Therapeutics. R. N. Chopra and J. S. Chowhan.—p. 339.
Yatren in Infection with Indian Strains of Endamoeba Histolytica (Chronic Intestinal Amebiasis). R. N. Chopra, B. Sen and J. C. Gupta.—p. 348.
Cyanide Poisoning and Its Treatment with Antidotes. B. Mukerji.—p. 353.
Presence of Anopheles Sundaicus ('Ludlowi') on Chilka Lake. R. S. White.—p. 361.
Affections of the Eye in Malarial Fevers and Kala-Azar. R. E. Wright.—p. 363.

Journal of Hygiene, London

37: 345-488 (July) 1937

Suprarenal Glands in Diphtheria. A. Maclean.—p. 345.
Oxygen and Carbon Dioxide Subcutaneous Tissue Gas Tensions in Cases of Hypertension. P. Ellman and H. J. Taylor.—p. 369.
Conception of Immunologic Specificity. W. T. J. Morgan.—p. 372.
New Salmonella Type Possessing Hitherto Undescribed Nonspecific Antigen. P. R. Edwards.—p. 384.
Value of Active Immunization Treatment Against Diphtheria. A. G. Morison and L. Roberts.—p. 388.
*Studies on Influence of Diet on Resistance to Infection: I. Effect of Various Diets on Fertility, Growth and Survival of Mice. M. Watson.—p. 396.
*Id.: II. Effect of Various Diets on Resistance of Mice to Bacterial Infection. M. Watson.—p. 420.
Sedimentation of Virus of Foot and Mouth Disease in Sharples Super Centrifuge. M. Schlesinger and I. A. Galloway.—p. 445.
*Purification and Concentration of Virus of Foot and Mouth Disease by Combined Centrifugation and Ultrafiltration Methods. I. A. Galloway and M. Schlesinger.—p. 463.
Reversible Neutralization by Congo Red of Anthracidal Power of Serum. J. Gordon and N. Wood.—p. 471.
Spermicidal Powers of Chemical Contraceptives: VII. Approved Tests. J. R. Baker, R. M. Ranson and J. Tynen.—p. 474.

Effect of Diet on Sterility, Growth and Survival.—Watson finds that zinc cages are unsuitable for housing mice, at least for the type of experiment dealt with. There appears to be some toxic element in the metal or solder used in their construction that adversely affects the condition, growth, fertility and survival of the mice. Glass cages give far better results. "Synthetic" diets containing wheat gluten or caseinogen, or a mixture of these two proteins with the addition of bran, dextrin, lard, cod liver oil, yeastrel and salt mixture, reduced the fertility of the mice almost to zero. They supported the growth of young mice, but growth and survival rates were both poor. A "natural" diet consisting only of whole oats to eat, and milk and water to drink, gave results that, except with regard to fertility, were as unfavorable as those given by the "synthetic" diets. With regard to the growth of young mice they were even more unfavorable. The best results, as judged by the fertility of breeding does, infrequency of litter eating, and the growth and survival of young mice, were obtained with three diets each of which contained about 25 per cent of dried separated milk. On these diets the mice throve well in all respects.

Diet and Resistance to Bactericidal Infection.—Watson also observed that young mice, bred and reared on a diet containing oatmeal, dried separated milk, dextrin or flour and water biscuit, coconut oil, cod liver oil, yeastrel, bran and milk and water to drink, are more resistant to oral infection with Bacterium typhi-murium, and to the intraperitoneal injection of a toxic substance isolated from that organism, than young mice bred and reared on a diet in which the amount of oatmeal is increased, and the dried separated milk, dextrin or flour and water biscuit and coconut oil are omitted. It is probable that the factor responsible for this increase in resistance is the dried separated milk.

Virus of Foot and Mouth Disease.—According to Galloway and Schlesinger, it is possible to concentrate the virus of foot and mouth disease on filter candles coated with acetic acid collodion. The degree of concentration of the virus effected was to the limit of expectancy; i. e., the increase in titer after concentration corresponded to the reduction of the volume of the liquid. By a combination of the two methods of purification of the virus, viz., washing once in the closed agar-lined cylinder of the Sharples super centrifuge and repeatedly on a graded collodion membrane of 25 millimicrons, very potent purified concentrates of virus can be obtained rapidly, especially if the final concentration is made on filter candles, coated with acetic acid collodion. In this way a concentrate of virus with a titer of 10^{-8} and a negative sulfosalicylic acid test for protein has been prepared in one day from virulent vesicle lymph (diluted 1:2) having a titer of 10^{-6}. The possibilities of the different methods of purification and concentration of the virus are discussed and a scheme is suggested for their application.

Journal of State Medicine, London

45: 373-434 (July) 1937

The Place of the Health Department in Housing Administration. J. G. Wilson.—p. 373.
Contribution of Recent Housing Legislation to Public Health. T. Peirson.—p. 397.
Food Poisoning: Its Epidemiology and Bacteriology. E. R. Jones.—p. 404.

Journal of Tropical Medicine and Hygiene, London

40: 149-160 (July 1) 1937

Some Experiences of Yellow Fever Endemicity in Africa and America. W. H. Hoffmann.—p. 149.

40: 161-172 (July 15) 1937

Quantitative Study of Excretion of Antimony. A. Hassan.—p. 161.

Lancet, London

2: 61-118 (July 10) 1937

*Value of Extracts of Suprarenal Cortex in Treatment of Addison's Disease. J. F. Wilkinson.—p. 61.
Treatment of Cushing's Syndrome with Large Doses of Estrin. A. M. Gill.—p. 70.
Thrombo-Angiitis Obliterans in Father and Son. F. P. Weber.—p. 72.
Agranulocytic Angina, Purpura and Tuberculous Laryngitis Complicating Pulmonary Tuberculosis with Recovery. A. B. Taylor.—p. 73.
Accessory Spleens. M. Paul.—p. 74.

Extracts of Adrenal Cortex in Treatment of Addison's Disease.—Wilkinson discusses the use of two adrenal cortex extracts on the market in the treatment of nine patients with typical uncomplicated Addison's disease. Four of the patients died despite intensive treatment—three from Addison's disease and one, in remission, from cardiac muscular failure. Two of these showed tuberculosis and two complete atrophy of the adrenals. Five patients have responded to treatment and are alive and in good health, the longest period of survival to date being three years and one month and the shortest nineteen months. One was a chronic case of moderate severity—not now being treated—and four were acute severely ill patients who responded to cortical extracts and are now on daily maintenance doses of sodium chloride. With this treatment, symptoms of asthenia, muscular weakness and digestive disorders were relieved, appetite returned, weight increased, the mental outlook improved and the pigmentation slowly faded. There was a slight improvement in the subnormal temperature after cortical extracts, but the occurrence of pyrexia is a bad prognostic sign. The blood pressure may take two or three months to show any significant improvement, and then apparently only if cortical extracts are given with or followed by sodium chloride therapy. Changes in the chemistry of the blood and urine show rapid responses to adequate treatment.

South African Medical Journal, Cape Town

11: 427-454 (June 26) 1937

Some Memories and Reflections. G. J. M. Melle.—p. 429.
Simplified Technic for Suprapubic Cystotomy. R. C. Begg.—p. 431.
Treatment of Cleft Palate Speech. W. K. Ward.—p. 433.
What Is the Correct Treatment of Pneumonia? M. F. Meiring.—p. 435.
Alkalemia, Producing Tetany in an Athlete. N. L. Murray.—p. 439.

Archives Méd.-Chir. de l'App. Respiratoire, Paris

12: 81-168 (No. 2) 1937

Abscess of Lung. H. Durand.—p. 81.
*Unusual Painful Forms of Pneumothorax and Spontaneous Hemothorax. M. R. Castex and E. S. Mazzei.—p. 111.
Cleidectomy as Complementary Operation of Thoracoplasty. L. Bérard, M. Dargent and J. Francillon.—p. 122.
Favorable Action, on Parenchymatous Lesion, of Contralateral Effusion in Course of Therapeutic Pneumothorax. E. Sergent, M. Fourestier and M. Franchel.—p. 135.
Section of Adhesions. D. Michetti.—p. 145.

Unusual Forms of Spontaneous Pneumothorax.—Castex and Mazzei observed a number of cases of spontaneous pneumothorax with an unusual symptomatology. They point out that usually the appearance of spontaneous pneumothorax is either insidious or manifested by evident symptoms, the most frequent of which are pain, dry cough and dyspnea. The pain, although variable as to type and intensity, generally has a thoracic localization. But occasionally it is localized elsewhere and may lead to erroneous diagnoses. The authors describe several cases which illustrate that pneumothorax and hemopneumothorax may begin in an extremely atypical and unusual manner and may simulate diverse disorders of other organs. The atypical forms may be classified as follows: (1) the form that is accompanied by fainting and convulsion, (2) the anginal form, (3) the brachialgic form, (4) the form with acute abdominal pain and (5) the form with chronic abdominal or lumbar pains. After reviewing a case from the literature, in which pneumothorax was accompanied by fainting, the authors say that in the anginal form of spontaneous pneumothorax the clinical picture may be exactly like that of angina pectoris. Discussing the brachialgic form, they mention two cases of pneumothorax in which the pains radiated into the arm. Further they describe a case of spontaneous pneumothorax which was masked by a pericardiac reaction. The forms of spontaneous pneumothorax that are accompanied by abdominal pains are especially noteworthy, because they may be mistaken for gastroduodenal perforation, cholecystitis or appendicitis. Their development has been explained by Pottenger as the result of viscerosensitive reflexes with a pleural point of origin.

Bulletin Médical, Paris

51: 505-528 (July 31) 1937

Modern Method of Examination of Nervous System. A. Plichet.—p. 507.
*Posttraumatic Juxtadural Hematomas. E. Krebs and P. Puech.—p. 512.
Abscess of the Brain. P. Puech and P. Winter.—p. 520.

Posttraumatic Juxtadural Hematomas.—Krebs and Puech discuss the diagnosis and the treatment of posttraumatic juxtadural hematomas on the basis of eight cases in which surgical treatment was employed. First they take up the extradural hematomas, pointing out that this type of hematoma is usually a complication of cranial fractures. In typical cases the hematoma is caused by a laceration of the middle meningeal artery or one of its branches. After describing the typical symptoms they discuss the examination of the fundus oculi and of the head and point out that in case of doubt ventriculography may be helpful. They report the histories of three cases in which extradural hematoma was present. Further they give their attention to subdural hematomas, pointing out that this type occurs chiefly in severe traumatism with or without cranial fracture or in mild traumas without fracture. In the latter cases the diagnosis is most difficult. The first symptoms appear sometimes in the week, the months or even the year following the trauma. The symptoms of subdural hematomas, if the previous trauma is unknown, may readily be mistaken for those of cerebral tumor. The patients complain of symptoms that indicate intracranial hypertension, often without signs of localization. In rare cases there are neurologic symptoms, attacks of Bravais-jacksonian epilepsy, hemiparesis, ocular disturbances and so on. The roentgenologic examination of the cranium rarely reveals the signs of a fracture. It is often said that the subdural hematoma is not visible in the roentgenogram. However, some observers say that the subdural hematoma gives a clear roentgenologic picture. Chavany and David observed a noticeable disjunction of the cranial sutures with warping in two of five cases of subdural hematoma. The authors observed the same changes in some of their cases, but they noticed them also in late traumatic serous meningitis without hematoma. The examination of the fundus oculi may or may not reveal a stasis of the optic papilla. The authors observed stasis in four out of five cases, but, on the whole, the papillary stasis is less frequent in subdural hematoma than in cerebral tumors. As a rule the diagnosis is not certain, unless it is corroborated by trepanopuncture or by ventriculography. After discussing the evolution and the clinical forms of subdural hematomas, the authors give brief histories of five cases. Then they take up the diagnosis of the late complications and finally the treatment. Regarding the latter they say that the juxtadural hematomas are amenable to surgical treatment. The technic of the operation differs, depending on whether the hematoma is extradural or subdural. The authors describe and illustrate the operation for both types of hematomas.

Presse Médicale, Paris

45: 1115-1130 (July 31) 1937

Syndrome of Late Epilepsy in Old Craniocerebral Injuries from War of 1914 to 1918. R. Targowla.—p. 1115.
*Can Epinephrine Be Considered as Cause of Hypertension? E. Dicker.—p. 1117.

Epinephrine as Cause of Hypertension?—In this paper Dicker considers whether the theory of the adrenal origin of hypertension can be confirmed. He reviews the studies of various investigators, giving especial attention to the reaction of Viale. He shows that this reaction is not specific and that its outcome depends partly on the diet of the examined patient. Moreover, the method of Viale is not capable of determining a physiologic augmentation in the epinephrine content of the serum and does not give the amount of substances produced at the time of the coagulation of the serum. From the sum of facts presented by the author it stands out that, if involvement of epinephrine in the mechanism of essential hypertension or of the hypertension of nephritis cannot be formally rejected, it appears impossible to produce experimental proof for the hypothesis that attributes to the adrenals a primary rôle in the pathogenesis of these two types of hypertension.

Schweizerische medizinische Wochenschrift, Basel

67: 685-704 (July 24) 1937. Partial Index

Relations of Essential Rheumatic Arthronosis Deformans to Primary Chronic Rheumatic Polyarthritis and to Chronic Articular Diseases. K. von Neergaard.—p. 685.
Reflexes of the New-Born. R. A. Lyon.—p. 689.
*Criticism of Methods of Determination of Uric Acid in Blood and Organs. H. Pinösch.—p. 694.

Criticism of Determination of Uric Acid.—On the basis of experiments, Pinösch is of the opinion that the newer modifications of the colorimetric methods for the determination of the uric acid produce unreliable results in that frequently only a small portion of the uric acid is detected and then again several times as much as is actually present. He thinks that the following factors are responsible for the erroneous results: 1. A greater or smaller portion of the uric acid is absorbed by the sediment during the process of deproteinization. 2. In the deproteinized fluid, the uric acid cannot be quantitatively precipitated, whereas this is readily possible in pure uric acid solutions. 3. In case of the direct determination in the deproteinized extract, there is not the slightest guaranty that really uric acid and not one of the numerous other reducing substances is determined. 4. The colorimetric determination of the uric acid produces fluctuating values not only on account of excessive sensitivity but also on account of the instability of the reagents. Moreover, since extremely small quantities of uric acid have to be determined, the error of computation is extremely large. 5. The titrimetric determination of uric acid according to Flatow has about the same defects as has the colorimetric method (error of deproteinization, nonspecificity and instability of reagents). The method of Edson and Krebs is entirely different. It avoids the deproteinization and determines the uric acid by manometric measurement of the urea that develops in the oxidative decomposition of the uric acid. To be sure, the method is considerably more complicated than the methods employed heretofore, but it seems to be the only one that produces reliable results.

Minerva Medica, Turin

2: 161-196 (Aug. 19) 1937

Seasonal Cycle of Tuberculin Allergy. M. Rigoni and G. Zanfrognini. —p. 161.
Grave Hemoptysis: Clinical and Roentgen Study of More Than One Hundred Cases. O. Maestri and A. Bernabò Silorata.—p. 163.
Artificial Pneumoperitoneum After Puerperium in Pulmonary Tuberculosis. U. De Michelis.—p. 183.
Relations Between Exudative Pleuritis and Pulmonary Tuberculosis. G. Berio.—p. 188.

Seasonal Cycle of Tuberculin Allergy.—Rigoni and Zanfrognini followed the behavior of Mantoux-Römer's intracutaneous tuberculin test all through the different seasons of the year for five consecutive years in all adult patients who entered the medical clinic of the Bologna University for treatment of different diseases. The total number of patients in whom the test was performed during that time was 1,600. The authors found that allergy to tuberculosis greatly intensifies in the spring, decreases in the summer, rises again in the autumn (although not as much as it does in spring) and again falls in the winter. The seasonal variations of allergy are constant for every year and have no relation to the organic conditions of immunity to tuberculosis. They are an epiphenomenon of the changes of the vasomotor centers due to seasonal hyperfunction of the vagal sympathetic. The biologic phenomenon is of sympathetic origin and independent from any direct action of external factors.

Artificial Pneumoperitoneum After Puerperium in Pulmonary Tuberculosis.—According to De Michelis, there are several factors that aggravate the evolution of pulmonary tuberculosis after the puerperium. There are hemorrhages, loss of organic, inorganic and hormone substances through lochia and lactation and the mechanical factor of the lowering of the diaphragm. In the case reported by the author, the aggravation of the disease after the puerperium was manifest. An artificial pneumoperitoneum was established. Intraperitoneal insufflations of from 300 to 500 cc. of oxygen were administered at intervals of six days for about three months. The symptoms of the disease rapidly abated and the general condition of the patient improved. The x-ray examination of the thorax showed elevation of the diaphragm. The treatment is well tolerated by the patients. The author advises resorting to it in cases of the nature of the one he reports so as to establish precise indications, the quantity of oxygen that should be administered and the possible contraindications.

Rivista di Patologia e Clin. d. Tubercolosi, Bologna

11: 481-552 (July 31) 1937

Blood Proteins After Thoracoplasty. E. Lenci.—p. 481.
Alcoholization of Visceral Pleura in Inefficient Pneumothorax. S. Gunella.—p. 485.
Variations of Complemental Power of Blood in Course of Hemoptysis. F. Capelli.—p. 494.
Subchronic and Chronic Hematogenous Tuberculosis of Lung. V. Lubich.—p. 499.
Phrenic Exeresis and Alcoholization of Phrenic Nerve. G. Gullotta. —p. 519.
Benign Lymphocytic Acute Meningitis: Case. G. Carella.—p. 525.
Blood in Pulmonary Mycosis. J. Chasis.—p. 534.

Blood Proteins After Thoracoplasty.—Lenci says that patients having pulmonary tuberculosis also suffer from a definite disequilibrium of the metabolism of blood proteins. There is a predominant amount of globulins over that of albumins in the blood of the patients. The latter are adapted to the disequilibrium in the course of the disease. The quantitative changes of the blood proteins are harmful to the body, as they cause physicochemical disorders of the blood and body humors in their relation to blood proteins, especially after thoracoplasty, when they are greatly intensified. According to the author, proteins from cells which were disintegrated by operative trauma enter the blood, alter the stability of blood proteins and break the balance of the water and colloid metabolisms of the blood in their relations to blood proteins. The latter, especially albumin, play an important part in regulating the exchanges of water between blood and tissues. The author advises the determination of proteins in the blood of patients suffering from pulmonary tuberculosis before and after thoracoplasty. The study is advisable for ascertaining the physiopathologic processes related to the operation, especially in patients with a greatly diminished amount of albumin in the blood before the operation. The author's study is based on determinations of the proteins in the blood of eight patients suffering from pulmonary tuberculosis who underwent partial thoracoplasty. The postoperative period in all cases was without complications. His article is a preliminary report.

Sperimentale, Florence

91: 193-308 (June) 1937

Researches in Experimental Poisoning from Bismuth. A. Trevisini. —p. 193.
Effects of Roentgen Irradiation of Thymus on Structure of Pancreas. G. C. Bentivoglio and C. Fumi.—p. 219.
Experimental Castration: Changes of Gallbladder. D. Rodinò.—p. 259.
Action of Iodine on Lung Cells. F. Crainz.—p. 276.
Blood Changes from Morphine and Atoximorphine (Morphine Campho-carboxylate) in Rabbits with Varying Thyroid Equilibrium. A. Donnini.—p. 297.
Histophysiology of Thyroid in Experimental Morphinism. A. Donnini.— p. 305.

Effects of Roentgen Irradiation of Thymus.—Bentivoglio and Fumi's experiments were carried on to clarify their postmortem observations. An infant who suffered from thymic hypertrophy made a clinical recovery after roentgen irradiation was administered to the thymus. Five months later he died from intercurrent pneumonia. At necropsy it was found that the cortex of the thymus was atrophic and the insular tissue of the pancreas was hyperplastic and hypertrophic. The other endocrine glands were normal. The authors also treated the thymus of puppies by roentgen irradiation. Some of the animals were given only 100 roentgens, whereas others received various irradiations in different amounts. The animals showed general nutritional and somatic disorders and also bone changes of the rachitic type, all of which varied with the race and individual resistance of the dogs to the treatment. The animals were killed at the end of the second month of the experiment. It was found that involution of the thymus from roentgen irradiation causes hyperplasia and hypertrophy of the insular tissues of the pancreas which are proportional to the intensity of thymic atrophy. The necessary condition for the development of insular tissues is the selective evolution of intense atrophy of the lymphoid tissues of the cortex of the thymus with relative survivance of the pancreatic medulla and Hassall's corpuscles. The phenomenon shows the existence of relations between the thymus and the insular part of the pancreas, by an indirect mechanism connected with the functions of the structures in regulating the sugar metabolism. It shows also the evolution of the thymic and insular processes that probably took place in the course of the clinical case reported by the authors.

Prensa Médica Argentina, Buenos Aires

24: 1465-1508 (July 28) 1937

Adrenal Glands: Preparation of Active Extracts. C. Bonorino Udaondo and G. P. Goñalons.—p. 1465.
Volhard's Test in Jaundice. Teresa Malamud.—p. 1469.
Abscess of Lung and Tuberculosis. J. Viale, J. B. Ticinese and R. Latienda.—p. 1478.
Multiple Abscesses of Lung and Osteomyelitis in Premature Infant: Case. C. M. Pintos and V. O. Visillac.—p. 1487.
Free Endometrium in Lumen of Fallopian Tube Coexisting with Isthmic Nodular Adenomyosis and Internal Peritoneal Hemorrhages: Case. C. M. Casco and E. V. Salerno.—p. 1493.

Volhard's Test of Water Elimination in Jaundice.—Malamud followed the behavior of the elimination of water in jaundice by means of Volhard's test of induced diuresis. The test is performed on patients resting in bed. It consists in administering to the patient 1 liter of light, tepid, slightly sweetened, lemon flavored tea and determining the quantity of urine passed. Normally the urine eliminated for the first four hours following the ingestion of 1 liter of tea is equal to and sometimes more than the quantity of tea ingested by the subject. The author performed the test in twenty patients suffering from jaundice. In all the cases the renal functions were normal. The test was performed several times in the course of the disease. There was slow passage of the urine during the test in eighteen patients. In the largest number of cases the retardation of the elimination of urine was more intense during the acute period of jaundice and became normal as jaundice disappeared. In some cases the urinary disorder was intensified as the jaundice was aggravated. In a few cases, however, the time of elimination of urine was shorter, in relation to previous tests

during the course of progressive jaundice. According to the author the elimination of urine in Volhard's test in jaundice does not follow characteristic curves. The test cannot be considered of clinical or operative prognostic value. The author concludes that jaundice is an important extrarenal factor in disturbing the elimination of water, which is retarded in the course of the disease.

Balneologe, Berlin

4: 305-352 (July) 1937. Partial Index

*Influence of Short Wave Treatment on Stomach. K. Neidhardt and H. Schlinke.—p. 305.
Thermal Waters and Their Clinical Use. H. Fritz.—p. 322.
Treatment of Exophthalmic Goiter in Spas. G. W. Parade.—p. 329.
Newer Results of Biologic Action of Therapeutic Springs. W. Pfannenstiel.—p. 332.

Influence of Short Wave Treatment on Stomach.—Neidhardt and Schlinke studied by means of x-ray examination the behavior of the stomach after treatment with short waves, 6 meters in length. The experiments were made on fourteen patients, of whom ten were free from gastric disorders, two had an old duodenal ulcer and two had subacidity. After five minutes of exposure to the short waves there was noticeable in nearly all experiments a reduction in the tonus and the peristalsis of the stomach, whereas the secretion of gastric juice increased. When the short waves acted on the stomach for thirty minutes, the remnant of contrast medium in the stomach was in seven out of eight examined persons from two to four times as large as was the case in the same person without irradiation. Thus it may be concluded that exposure to short waves reduces the motor action of the stomach. In discussing the therapeutic use of short waves, the authors point out that it is contraindicated in bleeding ulcers. However, short waves may be tried in all spastic conditions of the stomach, whether they are due to ulcers or to other local changes, also in all conditions of hypermotility resulting from duodenal ulcer, acute gastritis, tabetic crises and so on.

Klinische Wochenschrift, Berlin

16: 1009-1040 (July 17) 1937. Partial Index

Influence of Thyroid on Carbohydrate Metabolism: Intensity of Action of Insulin on Thyroidectomized Rabbits. F. Meythaler and Maria Theresia Mann.—p. 1009.
*Treatment of Anemia by Injection of Bone Marrow. A. Schretzenmayr.—p. 1010.
Development of Cutaneous Carcinomas and Sarcomas After Sun Irradiation and Photo Sensitization. W. Büngeler.—p. 1012.
Familial Occurrence of Adie's Syndrome with Hippus. M. Dressler.—p. 1013.
Determination of Lipase and Cholesterol in Multiple Sclerosis. Olga Altmann and Helene Goldhammer.—p. 1017.
*Progressive Muscular Dystrophy and Vitamin C. Y. Hirata and K. Suzuki.—p. 1019.

Treatment of Anemia by Injection of Bone Marrow.—Since it was difficult to secure donors for blood transfusions (in southern China), Schretzenmayr decided to resort to the injection of bone marrow in the treatment of severe forms of anemia which resulted from malaria and from helminthiasis. He reasoned that the effect of blood transfusion was probably partly due to the stimulating action on the bone marrow. Assuming that substances which stimulate the bone marrow would be present also in the bone marrow itself, he decided to administer by intramuscular injection freshly withdrawn human bone marrow. At first he used the marrow that had been withdrawn from the patient's own sternum. Instead of withdrawing an amount just sufficient for the examination of the marrow, he withdrew slightly more and reinjected the surplus into the patient. Later, he also employed marrow from healthy persons and from patients with strongly regenerating marrow (patients convalescing from anemia). In order to determine whether this measure did influence the bone marrow, the author studied the reaction of the reticulocytes and found a great increase. Moreover, many of the patients suddenly felt much better in the days following the bone marrow injection. This subjective improvement was similar to that which is often observed after the first injection of liver in patients with pernicious anemia. The status of the blood usually required a longer time to reach the normal level. In the severe, chronic cases, several weeks usually elapsed before the blood status was normal.

Progressive Muscular Dystrophy and Vitamin C.—Hirata and Suzuki were interested in the action of vitamin C in progressive muscular dystrophy and so they studied vitamin C economy of ten patients who had the disease in a more or less severe form. Tabular reports of the results of these studies indicate that these patients had a C hypovitaminosis, and it was decided to resort to treatment with vitamin C, of which the patients were given daily from 200 to 500 mg. by intravenous or intramuscular injection. In the course of this treatment the examination of the cerebrospinal fluid revealed an increase in the vitamin C content. Moreover, subjective as well as objective improvements could be noticed. The authors gained the impression that the continued oral administration of large doses of vitamin C surpasses in efficacy all other treatments of progressive muscular dystrophy. It exerts an especially favorable effect on the muscular adynamia. Although there is of course no regeneration of the already impaired muscle fibers, the muscular metabolism, particularly as regards the glycogen, the creatine-phosphoric acid and the adenylpyrophosphoric acid, is favorably influenced by the vitamin C and the dynamic power of the muscles is again utilized.

16: 1041-1072 (July 24) 1937. Partial Index

*Chemotherapy of Pneumococcic Infections. B. Kemkes.—p. 1041.
Gas Gangrene Bacillus Infection of Gallbladder. M. Meister.—p. 1044.
Cause of Retardation of Heart Beats by Deep Inspiration. J. Wallraff.—p. 1046.
Influence of Vitamin A on C: N Quotient in Urine. F. Lauersen, K. Voit and H. Wendt.—p. 1047.
Antianaphylactic Action of Aminopyrine and Phenyl Quinoline. A. Meyer and K. Mezey.—p. 1048.
Cobra Toxin in Therapy of Sensory Irritation Symptoms in Tabes Dorsalis. A. Rottmann.—p. 1051.
Formol Jellification of Serum (Reaction of Gaté and Papacostas). H. Reichel, F. Bettelheim and R. Brandt.—p. 1058.

Chemotherapy of Pneumococcic Infections.—Kemkes reviews the literature on the use of quinine in pneumococcic pneumonia and, in view of the different evaluations of the mode of action of quinine, he decided to make systematic studies with quinine preparations. It was his aim to determine whether and to what extent these preparations exerted a bactericidal influence on pneumococci. The in vivo experiments were made on white mice. In summarizing his observations the author says that the in vitro experiments with a quinine derivative which contains quinine hydrochloride and phenyldimethylpyrazolon and with a quinine glutaminate solution proved that these substances exert a bactericidal action on pneumococci of types I, II, III and IV. In testing these two substances and a quinine lactate solution in white mice that had been infected with pneumococci, he found that these substances exert a considerable therapeutic action. To be sure, a single therapeutic dose was not sufficient, but it had to be repeated several times in the course of a few days.

Strahlentherapie, Berlin

59: 189-382 (June 20) 1937. Partial Index

Roentgen Therapy of Superficial Tumors. P. Ott.—p. 189.
Influence of Rhythmic Interruption of Roentgen Irradiation on Biologic Object. P. Zacharias.—p. 224.
*Biologic General Action of Roentgen Rays from Point of View of Shock Effect Caused by Histamine or Similarly Acting Substance. E. Forfota and S. Karády.—p. 258.
Prophylactic After-Treatment. H. R. Schinz.—p. 291.
*Irradiation of Carcinoma After Operation. H. Wintz.—p. 305.
Question of Postoperative Irradiation of Cerebral Tumors. L. Guttmann.—p. 316.
*Roentgen Therapeutic Modification of Enlargement of Prostate. G. H. Schneider.—p. 346.

Roentgen Rays and Histamine.—Forfota and Karády report investigations on the action exerted by histamine on the general biologic action of roentgen rays. They began these studies on the assumption that the general effect after roentgen irradiation is actually a shocklike effect. Karády and another collaborator had previously demonstrated that histamine and the related H substances have an important part in the organism. It was found that the shocklike conditions are closely connected with histamine-like actions and that there are indications that histamine treatment might be effective in the prophylaxis of shock symptoms. In this report the authors describe observations on dogs, which they subjected to roentgen

irradiation without and with prophylactic histamine treatment. It was found that after a prophylactic treatment with histamine the general reactions of a roentgen irradiation were much less severe than when the histamine prophylaxis was omitted. If the general reactions after roentgen irradiation are actually the result of histamine action, there are two possible explanations for the prophylactic histamine treatment: 1. It could be assumed that the organism in response to the stimulus of repeated histamine administration forms antihistamine-like acting bodies, which in case of a new shock stimulus (roentgen rays) compensate for the suddenly released histamine; this would explain the occasionally observed hypercompensation. 2. It is possible that a prolonged histamine medication might cause an increased formation of the so-called histaminase, the ferment that decomposes histamine. The greater supply of this substance would effect a rapid decomposition of the histamine that is formed by the shock stimulus (roentgen irradiation). Both theories remain to be proved.

Postoperative Irradiation of Carcinoma.—Wintz points out that the problem of postoperative irradiation is much more difficult than it appears. He first evaluates irradiation after inadequate operations, then the irradiation of recurrences and then the prophylactic irradiation. Discussing the practical application of the postoperative irradiation, he says that the preliminary irradiation is always better than the postoperative irradiation and that this has been proved particularly with regard to carcinoma of the breast. The postoperative irradiation may have to be postponed on account of thrombosis or other surgical complications with the consequent danger of dissemination, particularly in cases in which the operation was incomplete. The author thinks that postoperative irradiation is always justified in inadequate operations. In the event that an apparently localized carcinoma has been removed into the healthy tissue, two points of view are possible: 1. The complete removal of all carcinoma cells is extremely rare and can never be definitely determined. For this reason the postoperative irradiation of carcinoma is justified in all cases. However, if irradiation is resorted to the entire carcinoma dose must be applied. The so-called prophylactic irradiation, which is given with small doses and for a long period, is worthless. The second point of view is first to take an expectant attitude and refrain from irradiation. If the carcinomatous tissue has already been completely removed, the after-irradiation is not necessary; if a dissemination existed before the operation or took place during it, the local treatment accomplishes nothing. The question remains whether an expectant attitude is justified if carcinoma cells remain in the surgical region. These carcinoma cells usually develop into carcinoma nodules. In these accumulations they are probably more radiosensitive than are the single cells. Accordingly, the author assumes an expectant attitude in all apparently complete operations. He resorts to irradiation as soon as a local recurrence makes it necessary. He justifies this attitude by directing attention to the fact that roentgen therapy is by no means an indifferent method that can be repeated as often as desired.

Roentgen Therapy of Enlargement of Prostate.—On the basis of experiences with roentgen irradiation in twenty-four cases of hypertrophy of the prostate, Schneider describes the technic of this treatment, the indications for its use and its favorable results. Discussing the technic, he points out that the irradiation with small doses will result in failure. He also stresses the absolute necessity of determining the exact distance between the skin and the prostate, so as to be able to compute the correct doses. As an epithelial proliferation, the hypertrophy of the prostate must be attacked with an intense, concentrated cross fire method. The focus depth dose for the glandular tissue of the prostate should be about 90 per cent of the unit skin dose. Depending on whether the rays are applied to a number of small or to a few large fields, this focus dose will require a skin dose of from 360 to 500 roentgens. The author prefers to apply the rays to five fields, each measuring 10 by 15 cm. One field is located at the perineum, and two each are parasymphysial and parasacral fields. If this is not possible, he applies the rays in the front and the back to three smaller fields, approximately 6 by 8 or 8 by 10 cm. If the distance between the skin and the center of the prostate is unusually long, he irradiates fields around the pelvis, each measuring 10 by 15 cm. In order to determine the distance between each field and the prostate, he first verifies by rectal palpation the distance between the prostate and the perineum. This one is usually shorter than that from the abdominal and from the sacral fields. The latter are determined by means of a combination pelvic compass, by introducing the straight branch rectally. On account of the sensitivity of the mucous membranes of the bladder and of the rectum, the back scattering of the rays must be taken into account. To determine this, the distance between the sacrum and the pubic symphysis must be found. In this connection the author stresses the value of Baudelocque's diameter. He further says that the irradiations of the different fields should be given as close together as possible. After the first main dose has been applied, and it is found to be inadequate, he gives in addition the so-called saturation dose. He irradiates from a greater distance a large field either in the region of the symphysis or in this and the sacral region and perhaps also in the perineal region. Regarding the efficacy of this treatment, he says that he obtained good results in all of the twenty-four cases and that there was not a single fatality. Moreover, he stresses that it can be used even in the severe forms of the disorder.

Zentralblatt für Chirurgie, Leipzig

64: 1745-1808 (July 24) 1937. Partial Index

*Treatment of Gas Gangrene by Complete Delimitation in Healthy Tissue. A. Borchard.—p. 1746.
Surgery of Early Childhood. H. Simon.—p. 1749.
Permanent Results of Surgical Treatment of Prolapse of Rectum. R. Demel.—p. 1755.
Simple Procedure for Later Removal of Peritoneal, Muscular and Facial Sutures Especially in Appendicitis. K. Kojima.—p. 1757.
Retroperitoneal Hematoma in Adrenal Tumor: Two Cases. J. Navrátil.—p. 1758.
Subcutaneous Gas Formation as Result of Cutting Injury Contaminated by Petroleum Derivative. E. Trevani.—p. 1763.

Treatment of Gas Gangrene.—Borchard reports a case in which, in a bicycle accident, a man, aged 23, sustained a small excoriation on the external surface of the little finger. The swelling spread to the upper arm and the crackling typical for gas gangrene could be heard. The rapid progress of the infection and the poor general condition of the patient indicated a highly virulent infection. Since amputation in the healthy tissue was no longer possible, the author made an incision around the area, about a hand's breadth away from the margin of the crepitant swelling. The incision surrounded the pectoralis muscle, nearly the entire scapula and reached downward to the fifth rib. Everywhere, except in the region of the neck, the incision went through the fascia. Hydrogen peroxide compresses were applied to this entire incision. Wherever accumulations of gas could be detected, wide incisions were made and finally the wound on the little finger was excised. All incisions were treated by means of hydrogen peroxide compresses. The general treatment consisted of the administration of large doses of gas gangrene serum, cardiac stimulants and oxygen. The patient recovered completely. The movement of the arm was not impaired. The author thinks that before resorting to amputation in case of gas gangrene the described method of isolating the focus of infection could be tried.

Wiener klinische Wochenschrift, Vienna

50: 1115-1146 (July 30) 1937. Partial Index

*Leptospirosis (Weil's Disease) in Animals. D. Wirth.—p. 1115.
Physical Exercise in Women. R. Franz.—p. 1117.
"Basophilism" (Morbus Cushing): Case. H. Urban.—p. 1122.
Development, Prevention and Treatment of Contracture of Shoulder. F. G. Schnek.—p. 1127.
Considerations on Nature and Treatment of Diabetes Mellitus. J. Wegierko.—p. 1130.
*Cardiac Echinococcus: Case. A. Wydrin.—p. 1135.

Weil's Disease in Animals.—Studies on 166 rats that were caught at different times in the sewers of Vienna revealed to Wirth that about 35 per cent of the rats are carriers of the type of Leptospira which is entirely like that causing Weil's disease. Field and house mice were likewise examined for the presence of Leptospira and it was found that 13 per cent of the field mice and 16 per cent of the house mice harbored Leptospira. The rats and mice that carry Leptospira eliminate in the urine

living and dead organisms. Whether this leptospiruria of the rats is the result of an attack of Weil's disease, or whether the animals just harbor Leptospira and remain healthy cannot be definitely stated. The examined rats that were carriers of Leptospira seemed healthy. In dogs leptospiroses occur under different symptomatologies, Weil's disease being one form, which develops not only in old dogs but especially in young ones; frequently an entire litter has it. The nonicteric forms of leptospiroses of dogs are known under various terms (dog typhoid, hemorrhagic gastro-enteritis and so on). Whether leptospiroses of dogs represent a danger to man cannot be definitely decided. There is no definite proof of transmission from dog to man, but the literature relates two cases in which such a transmission seemed possible. At any rate the danger seems slight. If icterohemorrhagic leptospirosis is induced in dogs, rats or mice, the animals rarely die from the infection. Guinea-pigs remain practically healthy or develop only a temporary indisposition, following infection with Leptospira, although the blood and abdominal punctate may contain Leptospira.

Case of Cardiac Echinococcus.—Wydrin reviews the literature on cardiac echinococcus and calls attention to the fact that according to the majority of authors the clinical diagnosis of cardiac echinococcus is extremely difficult and often impossible. Many cases remain unrecognized. The author reports the clinical history and the necropsy of a case of cardiac echinococcus which likewise was not diagnosed during the lifetime of the patient. The anatomic examination disclosed echinococcosis of the liver and echinococcosis of the ventricular septum of the heart, thrombosis of the left coronary artery and sclerosis of a part of this artery. Death was caused by the thrombosis of the coronary vessels.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

81: 3525-3644 (July 24) 1937. Partial Index

Young Psychopaths and Practice of Family Physician. J. Van Der Spek. —p. 3526.
*Contribution to Aspects of Phosphatide Lipoidosis. G. O. E. Lignac and P. H. Teunissen.—p. 3538.
*Intravenous Carbon Therapy. A. Van Meeteren.—p. 3548.
Culture of Tubercle Bacilli from Plug of Cotton Held Over Larynx During Cough. C. G. J. Dornickx.—p. 3553.

Phosphatide Lipoidosis.—Lignac and Teunissen list the different types of lipoids and then show that the lipoidoses are best classified according to the types of lipoids that are deposited in excessive amounts. They differentiate phosphatide lipoidosis (Niemann-Pick disease), cerebroside lipoidosis (Gaucher's disease) and cholesterol lipoidosis (Hand-Schüller-Christian disease). They report the clinical history of a male infant, aged 6 months. Anatomic, histologic and chemical studies proved that the child had died as the result of phosphatide lipoidosis. The authors also describe the results of the chemical analysis of the spleen of a patient with Gaucher's disease. Although this spleen had been in solution of formaldehyde for a number of years, the examination for lipoids still produced satisfactory results. Tabular reports list the results of the chemical analysis of the spleens and livers in several cases in the literature and in the authors' own cases.

Intravenous Carbon Therapy.—Van Meeteren reviews the literature on intravenous carbon therapy, pointing out that the carbon is usually administered in the form of a 2 per cent suspension of animal or wood charcoal in physiologic solution of sodium chloride. The individual dose usually varies between 4 and 6 cc. The number of injections likewise varies, the largest reported number being ten. Following these introductory remarks, the author reports the clinical history of a woman, aged 28, who developed a pneumococcic septicemia after childbirth. After several therapeutic methods had failed, including chemotherapy and serotherapy, the author resorted to the intravenous injection of a 2 per cent suspension of carbon. After that the attacks of chills ceased and did not recur. Subsequently the patient was given several additional injections of the carbon suspension. When the temperature increased again, it was feared that the carbon therapy had likewise failed, but examination disclosed a pneumonia in the right lower lobe. After the last injection of carbon, the temperature decreased again and the patient recovered.

Upsala Läkareförenings Förhandlingar, Uppsala

42: 331-473 (May 31) 1937

Effects of Recent Changes in Requirements for Medical Study at Lund University from 1928 to 1936. H. Sjövall.—p. 331.
*Epicardiac Coelothelioma: Case. N. Andolf, G. Bergmark and N. Gellerstedt.—p. 363.
Ocular Torticollis in Infant: Case. A. Normark.—p. 381.
Investigations on Respiratory Metabolism in Guinea-Pigs Overvitaminized with Cevitamic Acid. K.-E. Belfrage and N. Bergqvist.—p. 385.
Recollections from Uppsala Clinic from 1892 to 1895. B. Carlson. —p. 399.
*Arterial Symptoms in Deep Thrombosis of Lower Extremities. S. Lindgren.—p. 415.
Frequency of Mental Deficiency. G. Dahlberg.—p. 439.
Significance of Sexual Function in Resistance of Organism to Injurious Substances: I. Increased Resistance to Overdosage with Viosterol. E. Agduhr.—p. 463.

Epicardiac Coelothelioma.—Andolf and his associates say that the mediastinal tumor which was clinically and roentgenologically established at the onset in a man, aged 27, decreased in size on roentgen treatment, the cerebrospinal pressure became normal and the papillary stasis diminished. Before long a tumor of the parietal bone was established, but it yielded to roentgen treatment. Some months later the mediastinal shadow had grown larger and metastases were found in the fourth lumbar vertebra, the left iliac bone and the head of the femur. A gradual decline was followed by death. Necropsy showed the heart so transformed by large masses of tumors as to be hardly recognizable. The trunks of the pulmonary artery and the ascending aorta were surrounded by a neoplasmic mass 1 cc. in thickness. The posterior surface of the heart was covered with more isolated tumor nodules. The pleural cavities each contained about a liter of greenish yellow fluid and showed the same characteristics as the heart. Behind the manubrium of the sternum was a mass of grayish white tumors almost as hard as cartilage. In the liver were white tumors from the size of a pea to that of a kidney bean. The manner of growth of the tumors differed according to their localization. They tended to develop in the preformed intermediary spaces of the maternal tissue, without noticeably destroying it, although destruction was fairly well marked in some places. Distinguishable were (1) a diffuse sarcoma-like structure, (2) a trabecular structure with greater resistance to infiltration and (3) a type of alveolar kind in the metastases to the liver, lymph nodes and lungs. In the bone metastases the tumors in general resembled endothelial cells. In the vertebral column were an osteoplastic and an osteoclastic type. Twelve cases of endothelial tumors of the pericardium are cited. The authors conclude that the primary tumor in their case originated in the heart and they consider the seroendothelial cells the mother tissue of the tumor. They also say that epileptic attacks occurred during attacks of coughing at the time of the marked cerebral stasis, choked disk and augmented cerebrospinal pressure before the roentgen treatment of the mediastinal tumor and disappeared when the mediastinal tumor decreased in size under roentgen treatment and that the attacks of coughing ceased, which seems to them proof that marked cerebral stasis, acutely increased, can induce attacks of epilepsy.

Arterial Symptoms in Deep Thrombosis in Lower Extremities.—Lindgren says that a weakened femoral pulse is a frequent and early, if not constant, phenomenon in thrombosis of the deep veins and describes eleven cases of thrombosis in the femoral-iliac vein in which examination by the oscillometric method revealed more or less marked reduction of oscillation on the affected side. He also presents three cases of clinically established deep venous thrombosis in which no decrease in oscillation could be detected. He states that examination of ten cases of thromboplebitis in the saphenous vein showed no diminution in oscillation and that no change in oscillation appears in thrombosis limited to the peripheral veins. The best prospect of establishing deep thrombosis by oscillometry is at the start of the thrombosis. If in a case, usually postoperative, beginning development of deep thrombosis is feared, oscillometry is a valuable aid in diagnosis. Prognostically no conclusion can be drawn from the result of the examination; cases of long continued marked reduction of the oscillogram are reported in which no graver disturbances in circulation occurred than in cases with less pronounced reduction.